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ANTHROPOLOGICAL INSTITUTE  
OF  
GREAT BRITAIN AND IRELAND.

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APRIL 11TH, 1893.

Professor A. MACALISTER, M.D., F.R.S., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The presents that had been received were announced, and thanks voted to the respective donors.

Mr. G. M. ATKINSON read a paper by Mr. H. MICHELL WHITLEY and Dr. TALFOURD JONES on a "Cranium from a Grave at Birling, near Eastbourne, Sussex."

Mr. WHITLEY, Dr. GARSON, Mr. STOPES, and Professor MACALISTER joined in the discussion.

Professor MACALISTER read a paper entitled "Stray Notes on Egyptian Mummies."

Sir W. H. FLOWER, Dr. GARSON, and Mr. STOPES took part in the discussion.

Mr. W. H. L. DUCKWORTH read a paper on "Two Skulls from Nagyr."

Sir W. H. FLOWER and Dr. GARSON joined in the discussion.

A paper on "Damma Island and its Natives" by P. W. BASSETT-SMITH, R.N., was read.

VOL. XXIII.

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NOTE on a CRANIUM from a GRAVE at BIRLING, near EASTBOURNE, SUSSEX. By H. MICHELL WHITLEY, F.G.S., AND TALFOURD JONES, M.D. Communicated through G. M. ATKINSON, Esq., who exhibited the skull.

ABOUT five years ago in extending a chalk pit at Birling, about three miles westward of Eastbourne, several skeletons were found.

The discovery is fully described in the "Collections of the Sussex Archaeological Society," vol. xxxvii, p. 113.

During a visit which he paid to Eastbourne, Mr. George M. Atkinson urged the desirability of obtaining measurements of one of the skulls.

An opportunity having presented itself of doing this, the following notes are the result:—

The skeleton to which the cranium belonged was well preserved and was buried at a depth of 4 feet, the head being S.E. and the feet N.W.

The height was about 5 feet 9 inches, it lay on its back, the head inclining on the right shoulder, the right arm drawn up and resting across the breast, the left extended by the side.

Three long iron nails, and about two dozen small iron sandal nails were found at the feet.

Nothing else was in this grave, but in the others bronze armlets, a plain flat bronze ring, and fragments of an urn were exhumed.

We carefully measured the skull, which had been removed for that purpose, with the following results.

*Cephalic Index.* The long diameter from the glabella, or centre of supra-orbital line, to the most distant part of the occiput was 7·2 inches, or 186 mm.

The short diameter, or greatest breadth in the parietal regions was 5·2 inches, or 134 mm.

This gives a proportion of 100 to 72, and the cranium would therefore be classed as Dolichocephalic.

*Altitudinal Index.* The distance from the basion to the junction of the coronal and sagittal sutures was 5·1 inches, which gives a proportion of 100 to 71.

*Gnathic Index.* The distance from the basion to the alveolar point was 3·8 inches, which gives a proportion of 96 in 100, classing the skull as orthognathous.

*Nasal Index.* The height of the nasal aperture from the nasion to the lower border of the base of the nasal spine was 2 inches and the width of the nasal aperture 1·05 inches, giving

a proportion of 100 to 53; the nose therefore belongs to the Platyrrhine type.

*Orbital Index.* The horizontal diameter of the orbits was 1·63 inches and the vertical 1·50 inches, giving a proportion of 100 to 94, thus classing the cranium as Megaseme.

The distance across the orbits from one fronto-malar suture to the other, was 4·25 inches.

The extreme width of the zygomatic arches measured from one zygomatic suture to the opposite one, 4·9 inches.

The distance from the meatus auditorius was:—

I. To centre of supra-orbital line ..	5·50 inches.
II. To centre of frontal suture over the frontal eminence.. ..	6·00 „
III. To centre of sagittal suture over the parietal eminence ..	6·50 „
IV. To centre of occipital protuberance .. ..	6·65 „

A line drawn from the condyle of the occiput along the floor of the nostril and intersected by another line touching the most prominent parts of the forehead and upper jaw gave an angle of 85°.

The teeth remaining are sound but much worn down, the enamel good and sound and no apparent decay; in the upper jaw two teeth are missing, the sockets presenting a smooth and uniform appearance.

From the relics found with the skeletons their date must be assigned to the Romano-British Period.

Mr. H. Michell Whitley attended the meeting and exhibited the bronze rings and armlets. In supplementing his paper he remarked that—

The graves which had been described, and from one of which the crania was taken, belonged undoubtedly in his opinion to the Romano-British Period.

In this grave the long characteristic coffin nails were unearthed, and at the feet of the skeleton several little shoe nails, used in the sole of the Calceus, lay.

In another grave, that of a female, three bronze bracelets and a bronze ring were found; these had been submitted to Mr. A. W. Franks, and pronounced by him of Roman date, one having, however, a very peculiar ornamentation of almost Saxon type.

In another grave a little vase of pottery of the same period was found.

The valley at Eastdean has a bed of clay in its hollow, and in

this bed, rude pottery, shells, and chipped and polished flint implements have been found, between Eastdean Church and the road from Eastbourne to Newhaven.

The whole district abounds in traces of its early inhabitants, and the spurs of the hills at Eastbourne are especially rich in these remains. At Greenstreet he had uncovered a pit dwelling rudely walled around, with a hearth-stone in the centre, and several rubbish pits on the slopes of the hill opposite.

#### DISCUSSION.

Professor MACALISTER fully concurred in the assignment of the metal ornaments to the late Roman or immediately post-Roman age. Skulls of the peculiarly coffin-like shape, wide at the parietal eminences and tapering backwards to a capsular occiput, tapering more slowly forward to a narrow frontal region, were with some reason assigned by the late Professor Rolleston to the early Saxon period; with this view his own observations agreed. In a large Saxon cemetery examined by him in Cambridge lately all the skulls were more or less of this shape, and the same type prevails in the large collection of skulls found with Saxon knives and clasps and coins at Hauxton, Cambs.

Mr. STOPES directed attention to the extreme richness of this particular neighbourhood in relics of Palæolithic and Neolithic man, and the great amount of evidence of the numberless encounters that had through so many succeeding ages taken place on this natural front line of defence of our country.

More particularly he wished to direct the attention of members of the Institute to the great credit due to Mr. Hilton, of Eastdean, for the services rendered during the many years of unwearied and patient toil he had devoted to finding evidences of primitive man. His collection was a large one, and it was of the greatest benefit to our science to have in such spots men who quietly and steadily accumulate grand collections that are of so much interest in the present and are of still greater worth in preserving from destruction for future use, so many objects, the full value of which we do not yet know. A few years ago, he (the speaker) had ventured to direct attention to what seemed a rather wild hypothesis as to evidences of retrogression in pre-historic periods. The wonderful collection of Mr. Hilton had tended to confirm the opinion that there were times when men became possessed of highly polished Neolithic tools which they deliberately chipped back to ruder and possibly more convenient form, that they could more effectually handle. Many hundreds of tools of this type have been found in the neighbourhood of Eastdean, showing that the same story has been told there as in the Upper Thames valley, which is so exceedingly rich in tools of the same class. The Society was doing work



of the very greatest utility in encouraging all such workers to accumulate facts and to preserve such objects, as without their patient toil would probably be lost entirely to science.

Dr. GARSON remarked that he had had the opportunity of examining the cranium exhibited, and confirmed the various measurements of it which had been made by the author of the paper. From its low cephalic index it might be supposed that it belonged to the same race as the people whose remains are found in Long Barrows. It, however, possesses other characters which indicate that this is not the case, but that it belonged to a subsequent race which inhabited the country in what is termed the Romano-British times. This is in accordance with the archaeological relics found with it. In future explorations in the same district it is very desirable that other parts of the skeleton should be preserved, especially the pelvis and limb bones, which are very important. The hob-nails which were found at the feet of this subject are exactly similar to some found with a skeleton at Woodcuts, by General Pitt-Rivers.

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NOTES on EGYPTIAN MUMMIES. By A. MACALISTER, LL.D.,  
D.Sc., M.D., F.R.S., President.

THE Cambridge Anatomical Museum contains a large series of Egyptian mummy heads, nearly five hundred of which have been obtained within the last few years through the kind assistance of Dr. Budge. These I have unwrapped with great care, and as I have also had the opportunity of unrolling five whole mummies, I have, whilst thus engaged, made notes on some points which supplement the accounts given by those authors who have written on the subject.

The literature of embalming is not very extensive; and most of the earlier references are abstracted in Pettigrew's work published in 1834.<sup>1</sup> The information in reference to the earlier stages of the operation obtained from Egyptian sources is scanty, the well-known and oft-quoted passage in Herodotus (ii, 86-88) still constitutes the chief fountain of the literary history of these early parts of the process. In regard to the later and more purely symbolical stages, our knowledge is much greater. Papyrus No. 3 of the Gizeh Museum<sup>2</sup> gives an elaborate description of this portion of the office, and papyrus 5158 of the Louvre, although it is, unfortunately, in a fragmentary condition, supplements this in several details. The several funeral

<sup>1</sup> "History of Egyptian Mummies," London, 1834.


<sup>2</sup> Maspero, "Mémoire sur quelques papyrus du Louvre," 1875, pp. 14-104.


rituals<sup>1</sup> which exist in several papyri, and in some tomb inscriptions, give additional information with reference to these later performances. There are, in addition to these, many references to parts of the ritual in monumental inscriptions.

In the present paper I intend only to treat of some points regarding the materials and methods used in embalming, which I have noted in the course of my unwrappings. I reserve my notes on the physical Anthropology of the Ancient Egyptians until I have completed my measurements and comparisons.

The mummies on which my observations have been made, according to the information obtained from the respective donors, are of different dates, but are chiefly of persons who lived in the times of the twelfth, nineteenth, and twenty-second dynasties, dating approximately from the twentieth to the eighth centuries before the Christian era. One belonged to the twenty-sixth dynasty, and two were of Ptolemaic age. They were mostly middle class folk, the class whom the explorer on the spot, to whom the wealth of more interesting remains is accessible, would naturally pass by without notice, but who are of interest to the anthropologist, as, in general, among all nations these are of less mixed blood than the classes of a higher or of a lower social grade. They were of all ages from twenty months up to edentulous old age, and consisted of individuals of both sexes.

The materials on which I have to remark are the linen of the bandages and the preserving materials; each has given a name to the mummy in the ancient language of Egypt. The body

was called  *kesin* "the wrapped up one," from

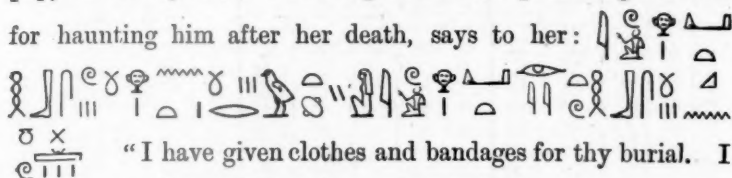
its form and bandaged condition. It was also named  *ab* "the pure one," from the belief that the spiritual parts were purified after death in the lower world just as the physical frame was preserved by the process of embalming.

As Pettigrew and others have noticed, the quantity of linen used in clothing the mummy was enormous. The bandages of one which I unrolled in Cambridge must have been nearly a kilometre in length, while those of another were over twelve kilogrammes in weight. In one neck I counted fifty-three layers of bandage superposed, and over one face thirty-five layers crossed at one spot.<sup>2</sup> The quantity used seems to have been in

<sup>1</sup> Schiaparelli, "Il Libro dei Funerali," 1882-1890. 3 vols.

<sup>2</sup> Greaves in his "Pyramidographia," 1646, writes, "there could not be lesse than a thousand els upon one body." See also "The Linen Trade," by A. J. Warden, 1864, p. 155. This work contains much curious information on the linen fabrics of antiquity.

some sort a measure of the affection of the relatives. In a papyrus in Leyden, a sorrowing husband, reproaching his wife for haunting him after her death, says to her:



"I have given clothes and bandages for thy burial. I have given to be made for thee many clothes."<sup>1</sup>

I have microscopically examined very many pieces of this cloth from mummies of different periods, and I have found that in all cases it is pure linen. This point, indeed, has been set at rest by the microscopical researches of Bauer, as recorded by Thomson and Yates.<sup>2</sup> The last-named author has dealt exhaustively with the subject from the standpoint of classical literature, and has proved that the *σινδών βυσσίνη* of Herodotus, which was supposed, erroneously, by Rouelle and many others to be cotton,<sup>3</sup> can be no other material than flaxen cloth. Not a trace of cotton fabric was found in any of the specimens which have come under my notice.

The texture of the linen which enwrapped these mummies is variable in strength and fineness, and justifies the somewhat extensive nomenclature of the different forms of the fabric which are so puzzling to the students of Egyptian texts. M. Rohault de Fleury<sup>4</sup> published some years since a letter to M. Devéria, in which he tabulates the numerical constants of the linen taken from mummies in the Louvre, in terms of the weight of the square metre in grammes, the number of threads in the warp, and the number in the woof in each centimetre of length or breadth. I have made many similar observations, and have combined his results with mine in the following table, indicating my additions to the series by the letter M, those of his table being marked by F. In fabrics prepared by hand-spinning and hand-loom weaving one naturally expects a greater variety in the results than in the more uniform products of steam-power machinery; so it is probable that we have not exhausted in this table the varieties existing both in regard to the size of the yarn, and the closeness of texture:—

<sup>1</sup> Papyrus, i, 371. Transcribed in Maspero, "*Études Égyptiennes*," p. 155, and in "*Quelques Peintures*," p. 155.

<sup>2</sup> "*Philosophical Magazine*," 3rd Series, v, 1834, p. 355. Sir G. Wilkinson quotes this author as "*Thompson*," but does not give the reference.

Yates, "*Textrium Antiquorum*," i, 254.

<sup>3</sup> "*Mémoires de l'Académie Royale des Sciences*," 1750, p. 123.

<sup>4</sup> "*Les Étoffes Égyptiennes*," "*Revue Archéologique*," N.S. 1870, p. 217.

No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.	
1	66	32	122	M.	8	32	17	109	F.	15	28	14	236	F.
2	62	32	42	F.	9	32	16	88	F.M.	16	28	12	390	F.
3	52	31	55	F.	10	30	20	76	F.M.	17	28	11	250	M.
4	46	20	88	F.	11	30	15	90	M.	18	28	10	..	M.
5	40	20	88	M.	12	30	14	153	F.M.	19	26	16	214	M.
6	40	17	200	F.M.	13	30	8	100	M.	20	24	22	..	M.
7	36	14	262	F.M.	14	28	16	171	F.	21	24	18	100	F.

No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.	
22	24	16	420	F.	29	20	10	166	F.
23	24	16	450	M.	30	20	9	343	F.
24	24	14	250	M.	31	16	8	375	F.
25	24	12	237	F.	32	14	14	276	M.
26	24	10	172	F.M.					
27	22	12	172	M.					
28	20	12	230	F.					


Almost all the specimens show that, as Thomson has described, the threads in the warp are always more numerous than those in the woof. At the same time M. Fleury puts it too strongly when he says "la chaîne a presque toujours deux fois plus de fils que la trame."


There is a great range of variety in the fineness of the yarn, and in the degree of closeness of the twist in its spinning. In the finer textures it is very firmly and closely twisted, there being five to seven twists in each mm., and the diameter of the yarn is from 0.12 to 0.2 mm. From this they range upwards to coarse threads of 1 mm. and even greater thickness, and with scarcely six twists in the cm. The woof yarn is much coarser than that employed for the warp; thus in the more common varieties like Nos. 20 to 26, it is about 0.35 mm. while that of the warp is about 0.26. In Ure's "Dictionary of Manufactures"<sup>1</sup> it is stated that the Egyptian spinner rarely made yarn finer than 50 leas, whereas the modern yarns are spun to 300 or even to 1,200 leas; but in the fabric No. 1 in our table the warp-yarn must have been spun to 325 leas and the woof-yarn to 160 leas.


<sup>1</sup> 6th edition, vol. ii, p. 337. Yarn is "counted" by the number of leas, each 300 yards in length which can be spun from 1 lb. avoirdupois of flax. In Marshall's tables ("The Practical Flax-Spinner," 1885, pp. 40 and 220) 350 leas is the finest texture given.

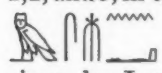
I have submitted a number of samples of these linens to my friend Mr. Hugh Porter, who is well acquainted with the different textures of Belfast linens, and he tells me that the linen which is most commonly used in the wrappings is extremely like that known in the trade as 11<sup>00</sup> linen, only that in the modern textures there is approximately the same number of threads in the cm. of warp and woof.


The varieties in the texture of the yarn are intelligible, when we observe the process of manufacture as shown on the monuments. In the tomb paintings at Beni-hasan as copied by Lepsius (*Denkmäler*, II., 126), we have depicted the successive stages of this industry; the "retting" of the flax, and the beating out of the fibres with wooden beetles. The twisting of

these into the yarn is accomplished with a spindle called  *kheseḥ*, seldom if ever with a distaff. There are in the several museums various patterns of these wooden spindles for different kinds of yarn.<sup>1</sup> In one of the pictures, the operation of spinning

is named  *set*, and the spinner holds the end of the yarn in his hand. In another picture it is over his shoulder; in another the end is fastened to a forked upright staff (*Rossellini*, xli, 4), and the spindle is in the hand of the workman. In another the making of the very fine yarn is shown. It is being twisted on a flat stone, and after this it is rolled between the hands of workwomen, who are represented kneeling and rubbing the threads smooth on the stone. It is to this process, which is named

 *teker* (*Champollion* II., 342 and 362), that the highly polished, smooth and finely twisted warp threads of the stuffs Nos. 1, 2, and 3, in the table owe their closeness and lustre. The name

 *mesenā* is applied to this process in the plate given by Lepsius. After spinning, the yarn is gathered into hanks for the weaver.

The process of weaving, which was named  *sekhēt*, is also represented on the monuments, and is referred to by Herodotus (ii, 35). I have not data sufficient to determine what was the breadth of the web of cloth in my specimens, as I have found few satisfactory pieces with a selvage on each side. The web must have been of considerable length, as some of my bandages measure over ten metres in length and have been cut off at one end. Mr. Griffith in his notes on the story of the

<sup>1</sup> Spindles of the twelfth dynasty are figured by Petrie "*Kahun*," Pl. IX, Fig. 26, and p. 27.



Sekhti translates one passage "the width of a piece of cloth," and suggests the probable explanation that the Egyptian looms usually produced cloth of a fixed width.<sup>1</sup>

The textures marked 31 and 32 are remarkable, as in them each two contiguous threads of the warp are treated as one in shedding; that is, they are simultaneously raised and depressed to allow of the passage of the shuttle, which also carried two parallel threads of the weft simultaneously. The result is a pretty double-threaded texture resembling in pattern that represented by Ashenhurst in his figure 155B.<sup>2</sup> The linen fabric in the market at present, which resembles this most closely, is one called Java canvas, but this is slightly more complex, as it is diapered. There is a cotton cloth in the shops exactly like it, used for tennis shirting now-a-days. The fabric No. 32 is the only Egyptian cloth in my collection in which the numbers of threads in the warp and woof are equal. In one specimen the warp thread is double, each pair being twisted, while the woof thread is single. In another there are parallel pairs of warp threads as in No. 32, but only a single woof thread, making a pattern like Ashenhurst's Fig. 58 (p. 170).<sup>3</sup>

In all my pieces the end of the web is strengthened by strong woof filletings, each of four or five threads of yarn carried simultaneously, either parallel or twisted together in a bundle, by the shuttle, and returning either immediately at the next shedding or after two or more wefts of single threads of ordinary size. There are many varieties of this filleting which resembles that now in use in towels or coarse pocket-handkerchiefs. In some the woof threads between these double fillets of the border are of blue yarn<sup>4</sup>, making a blue stripe one cm. or more in width resembling the edge of a modern gingham. I have no examples of true diapering or twilling or of fancy weaving such as may be seen represented on some of the monuments, or such as M. Fleury has figured from specimens in the Turin Museum (*loc. cit.*)

There is often a stronger thread laid at regular intervals in the warp, and in like manner a proportionally thicker thread

<sup>1</sup> "Proc. Soc. Bib. Archæology," xiv, p. 466.

<sup>2</sup> Ashenhurst, "Weaving and Designing of Textile Fabrics," Huddersfield, 1887, p. 199.










<sup>3</sup> The weights of the metre-lengths of the cloth are only approximate, as it is not easy to free the cloth of adhering foreign matter, and few pieces have a sel-vage along both sides. Of No. 6 in the Table, some pieces had 14, some 17, and some 20 woof threads. Its weight also varies from 200 to 220 grammes. One specimen of Fleury's 24 by 14 (No. 24) weighed 387 grammes.

<sup>4</sup> The blue pigment was produced by the use of a plant called *ternoken* (Dümichen, Dendera, 19, 10), probably indigo, as Thomson showed; the red is a vegetable dye, but I do not know its nature. Thomson believed it to be safflower. In one text the dye-stuff is called "the plant *nesti*."



used at about the same intervals in the woof, giving a somewhat chequered appearance to the stuff. This is so regular that it must have been done by design, not by accident.

The end may be left plain as an irregular ragged fringe when it is cut off from the beam, but sometimes it is carefully finished off as a regular fringe whose tags are from 5 to 12 cm. long. Each of these consists usually of four warp threads. Each pair of these threads is twisted into a cord, and the two contiguous cords are then twisted into one tag. These threads are knotted a little beyond the middle to prevent their unravelling, and from this to the free end they are loosely twisted so that the end appears loose and soft. The texture is wonderfully regular considering that the weaver used one or two sticks to answer the purposes of the healds, treadles, and battens of an ordinary hand-loom.<sup>1</sup> Indeed, it is amazing how with such simple appliances as those pictured on the monuments, fine cloths like No. 1 were woven. This very fine cloth was known even in the earliest times, for there are fabrics nearly as delicate in the Berlin Museum taken from the mummy clothing of Pepi, who died about B.C. 3200. My finest samples came from a twelfth dynasty mummy dating from about B.C. 2200.

The generic name for the clothing either of the living or dead was    *hebs*, often coupled with    *menkh*, which is often written by its determinatives alone. These words occur in texts of many kinds, especially in the funeral formula of the common proscynemata in which the gods, especially Anubis, are invoked to grant clothing to the deceased. It must be remembered that the process of embalming was a divine work throughout, and that the earthly embalmer was the representative of Anubis, who is pictured on almost every mummy case of the better class as performing with his own hands the operations of the preservation and enwrapping of the body, and who takes the credit and responsibility of the task. This is often expressed in the inscriptions on the cartonnage or coffin. For example, on the coffin of Hatbastru in the Leipzig Museum, Anubis is represented as saying   

<sup>1</sup> It is probable that a comb-like slay was used to drive home the weft after each passage of the shuttle, like that mentioned by Ovid (*Met.* vi, 58),

"Percusso feriunt insecti pectine dentes."

There are three comb-like implements of this nature from tombs at Akhmim and Thebes in the British Museum. (Nos. 18, 182; 20, 747; 20, 748.) Many similar combs with long handles have been found in the Scottish brochs (Anderson, "*Scotland in Pagan Times, The Iron Age*," p. 213), showing how widely spread this method of striking home the weft was among very diverse races.



“I come to thee and protect thee, I make perfect thy flesh, I dispose thy limbs in order, I articulate thy bones, I fill thy vessels, I stretch thy muscles.” Similarly a stele in Vienna

(No. 55) has the inscription “Anubis himself hath made the mummy.”

The flax plant and its derivative, linen, is named in the texts

*meḥā*, the word being sometimes used in the plural as in Papyrus Anastasi, iv, 8–11. This word is the parent of the Coptic name .<sup>1</sup> The ancient linologists distinguished the flax plants of Upper Egypt from those of Lower Egypt, and Pliny<sup>2</sup> informs us that there were four different kinds of linen made in Egypt, named from the provinces in which they were manufactured, Tanitic, Pelusiatic, and Butine from Lower Egypt, and Tentyritic from Upper Egypt. This distinction is confirmed by native records, for we find in Sallier Papyrus II, 13–7, that Lower Egypt is called the land of *Meḥā*, and the Thebaid is the land of *Kema*.<sup>3</sup> In the papyrus 3 from Gizeh published by Mariette<sup>4</sup> it is said that Harse-isis, son of Osiris, brings to the dead a portion of bandage of *Henes*, of the royal house, probably material from this last-named district.

The monuments refer to a fine linen called royal linen *suten šes*, and of this material the Great Harris Papyrus tells us garments, tunics, coverlets, caps, sheets of Horus, ear-flaps and coverings for the god Amen were made.<sup>5</sup> It was of this royal linen that the bandages of Sauf were made, as we learn from the Rhind Papyrus,<sup>6</sup> and it was expensive material, for in the same document it is called costly stuff.<sup>7</sup> It was probably of the same nature as the cloth known as *seseḥ*, which, according to a text quoted by Brugsch, seems to have been red.

This royal linen is contrasted, in the Harris Papyrus, with a

<sup>1</sup> Goodwin, in “Zeitschr. f. Ägypt.” 1867, p. 54.

<sup>2</sup> “Hist. Nat.,” xix, p. 1.


<sup>3</sup> Brugsch, “Diet. Géog.,” 1202.



<sup>4</sup> “Pap. de Boulaq,” p. v, 21.




<sup>5</sup> Pl. XIVa–X–XVII. This material is sometimes called simply *suten*, see Maspero, “Du genre épist.,” 14.

<sup>6</sup> Pl. VI, 2, and XXVII, 9.



<sup>7</sup> Pl. VI, 6.




second kind, the  *kemā nefer*, "good southern linen," i.e., linen of Upper Egypt, Pliny's Tentyritic linen. This was also used for tunics, earflaps and other clothes as detailed in the list of presents of Rameses III. to the house of Amen Rā.<sup>1</sup>

There is a third variety of linen mentioned in the same document as   *māku* linen. Birch<sup>2</sup> translated this "mixed linen," but it seems rather to mean domestic linen, linen for household use. Fewer articles of this fabric were presented by Rameses than of the other materials, as though it were less suitable for the purposes of offerings. The word seems connected with a root which means "to cover," and Brugsch suggests that it may have been a coarse fabric, but his reasons are not convincing.

The Rosetta stone uses another word for fine linen    *peku* linen. This is probably the same as the *suten ses*, and it is rendered in the Greek version as equivalent to ὀθόνιον βύσσινον. The context tells us that this was made in the temples for the royal palace, and hence the distinctive name "royal." Of the tribute of this article Ptolemy Epiphanes remitted a part.<sup>3</sup> This same material, royal linen, is mentioned in the funeral papyrus of Gizeh, in the text, "Thou hast received the bandage sacred to Pā Rā and the piece of stuff woven in the temples."<sup>4</sup>

Linen was also made in other towns. That of Saïs was ordered for the bandages of the fingers; and in the funeral papyrus one cloth is described as "marvellous" from Pa Harmerui.

The different parts of the web had doubtless received different names from the Egyptian weavers. Mr. Griffith conjectures that the two words *sṭb* and *npnpt* used to describe the edges of the cloth by which the covetous steward blocked up the way of the ass of the Sekhti, may mean the "cloth edge," and the "fringe," respectively.<sup>5</sup> These words may fulfil the condition of the story, as we are told the cloth was square, otherwise as the fringe is formed of the warp it is at the long end of the cloth, and not at the side. Brugsch considers that   *tes* means

"selvage," and De Rougé conjectured that    *sa*, meant the fringe of a garment. This word, however, is also

<sup>1</sup> Pl. XIV-VI-XII. This is probably the same as the *nefer res* of the Medum inscription given by Prof. Petrie (Pl. XX.).














































































<sup>2</sup> "Records of the Past," vi, p. 40.


<sup>3</sup> *Ibid.*, iv, p. 73.





















<sup>4</sup> "Pap. de Boulaq," 3, v, 5.


























<sup>5</sup> *Loc. cit.*, p. 467.

used as the name of a bandage. The priest in one portion of the funeral ritual is said to apply the *sau* bandage.<sup>1</sup>

In several inventories there are at least three of these kinds of linens mentioned, and these are again classified numerically. Brugsch conjectures that this sub-division may depend on the number of threads in the yarn. Of the  some is marked as  some as  and some . In one place a fourfold *šes*  is mentioned. Brugsch quotes a text in which one is said to be                         . This he translates "clad in eight-thread garments and girdled with four-thread material."<sup>2</sup> The four-thread material is called         ; the eight is called                   or *psit*; the hundred stuff is called                     = *šā*.<sup>3</sup>

Whatever the nature of this classification may be, it cannot refer to the absolute numbers of threads, for of *kemā nefer* one inventory gives a number of categories two, three, four and a hundred. It was more probably some method of distinguishing them according to fineness. Of another linen which is named  *sun*, there are one, two, three, five, six, seven, eight, nine, and one hundred given as its varieties. Textures like those very fine stuffs which head my table of fineness may be, as Brugsch




















suggests, the                      *ans* mentioned in the Esneh Calendar, and probably are the same as the transparent fabric depicted on some monuments as an article of clothing; but *ans* in the Book of the funeral ritual means a rose-red coloured fabric.

The linens used for embalming in my specimens were either white or of a saffron or orange colour. The white linen is named                          *etct.* In the funeral papyrus of Gizeh this is said to be "resplendent as crystal." Most of my linen was not white but was dyed with the reddish yellow pigment, which is freely soluble both in water and spirit. Linen of this colour was































































<sup>1</sup> Schiaparelli, "Il Libro dei Funerali," ii, 14.

<sup>2</sup> "Dict. Géog.," p. 303.

<sup>3</sup> In the inventory found in the tomb of Rahotep at Medum there are mentioned *šā* linen, of which six kinds are specified, 100, 9, 5, 4, 2, and 1, *seunnu* of which 100, 4, 2, and 1 are given, and *neter*, of which 100 is mentioned, and in another place its varieties are given as 100, 4, and 2. See Petrie, "Medum," Pl. XIII, XX. There is another fabric, *tema*, mentioned in Pl. XVI, of which there were three sorts, 100, 4, and 2.


probably that called   *âtma* or dark red. The other colours used in the funeral ritual are called  *uat-t*, "green," and   *aruti* or blue. In the funeral rituals such as that of the Louvre and Abydos, in the description of the later symbolical stages of the priestly operations, there is one chapter entitled               "Chapter of putting on the white bandages." After this comes the "chapter of putting on the green bandage,"<sup>1</sup> then that of the investiture with the light red bandages (*ânsi*), then that of the dark red bandages (*âfemâi*). After this, the *Usekh* collar was put on. I have found nothing in my specimens corresponding to these successive layers of different colours, so it is probable that these investitures were only symbolical, or perhaps confined to royal or great personages: at least it is certain that in all my specimens there had not been a succession of these as real ceremonies.

The mummy cloth for the bandages was torn into strips, not cut. Most of the bandages used in swathing the head and neck were narrow, averaging from six to ten cm. in width. Sometimes, however, there are broader strips twenty cm. wide, used for covering the face and body.

These bandages are often referred to in funeral inscriptions and were called  *ut*. They have given one of the names to the undertaker, who was called      *witi*, "the bandager." This application of swathes is a divine task; thus, in the Rhind papyrus, Anubis is called              "Anubis the bandager." In other inscriptions bandages are sometimes called      *bant*, and sometimes      *ti* or      *tai*, and the act of bandaging is called      *îam*, a word which occurs in the Rhind papyrus. It is probable that there were generic differences between the bandages so differently named. In one text we are told                        "Thy

<sup>1</sup> Schiaparelli, ii, p. 27, 30, 34, &c.



body is clothed in "a garment of the gods." The word   $\delta$  *seben*, like its Coptic derivative *ceβen*, is also applied to bandages in general.

Some of these bandages on my specimens were in a remarkably good condition when taken off, requiring to be cut as they did not tear easily. We know from the story in Herodotus (vii, 181) that the same kind of linen was used for surgical bandages as for embalming; and, indeed, when these are rolled up they closely resemble the bandages out of a hospital surgery. There is a well known Greek epigram given by Brunck ("Analecta," iii, 169) which refers to this.

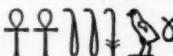
Ἰητρος Κρατέας, καὶ Δάμων ἐνταφιασῆς  
 Κουήν ἁλλήλοισ θέντο συνωμοσίην.  
 Κάι ῥ' ὁ μὲν ὅς κλέπτεισκεν ἀπ' ἐνταφίων τελαμῶνας  
 Εἰς ἐπίδεσμεύω πέμπε φίλῳ Κρατέᾳ.  
 Τὸν δ' ἀπαμειβόμενος Κρατέας εἰς ἐνταφιάζειν  
 Πέμπεν ὅλους αὐτῷ τοὺς θεραπευομένους.<sup>1</sup>


The methods employed in applying these bandages were very varied. I have not been as fortunate as Dr. Granville, who describes finding in the mummy which he unwrapped, examples of the *couvre-chef*, the scapularium, the eighteen-tailed bandage, the T-bandage, the capistrum, and the linteum scissum. I have from time to time in unwrapping my heads, found some specimens of most artistic and elegant bandaging, but have never seen these different forms combined in one body. The commonest form of head bandage is a modification of the figure of eight. There is in many a long wide piece of cloth beneath the bandages proper coming up over the breast, over the front of the neck and face and brought down over the top of the head and nape and down the back. This agrees with the description of the bandage of *Sebekh*, in the Boulaq papyrus, and possibly with the *nemes* (Schiaparelli, ii, 9), and it is directed to be put on when the body lies on the bier with its face upturned and its back soaked in oil. Over this is a narrow bandage applied first round the neck, then crossing on the back of the head, then brought over the forehead, then backwards over the neck, then after another turn round the neck it is made to cross again on the occiput. This is probably the bandage which in the papyrus of the embalmment is called "the bandage of Harmakhis of Hebit." Over this, a second bandage of the same width is applied in an opposite direction, so as to decussate the first. This is called the bandage of *Nekheb*, which is said to cover the forehead. A third bandage is applied at first round the neck and horizontally across the

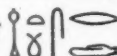
<sup>1</sup> De Quincey's happy paraphrase of this is familiar to all readers of his Essay on "Murder as one of the Fine Arts."



face; this is the bandage of Hathor the Lady of Ännu. This ends under the chin and finishes at the obelion. There is a fourth bandage also beginning around the neck, then passing over the occiput across the bregma, then down in front of the ear, under the chin, around the neck, then backwards over the sides of the face crossing the last on the top of the head, and so on. This is the bandage of Thoth Äp-herui. This bandage was probably applied as a double-headed roller. A similar bandage, I have once found, applied over this, crossing the cheeks from above downwards. This may be the appliance which is called on

account of its doubleness  *ankhtesu*, and is spoken

of as "the two terui, two rolls of linen named ankhtesu." It is possible that these may be the names of the plugs of cloth sometimes forced into the mouth. The continuation of this bandage below is probably the bandage of Nebthetept. Over this is another double-headed roller crossing on the vertex and under the chin alternately. This may be the band called the double *uta*, or else that called "the bandage of Sekhet, the great, beloved of Ptah, of two pieces for the head." Over this in some cases is an oblique bandage over the nape and forehead crossing on the nape, which is possibly the  *et'et* or the white bandage.

The portion of the bandages which crosses the ears is specified as the bandage of  an excellent linen from Hat Hesmen.<sup>1</sup>

It is to be applied over the two ears "by Thoth Äp-herui, the pacificator of the gods in Unnut." The strip which fulfils this description is generally the continuation of No. 4. In all there are prescribed 22 folds on each side of the face passing over the two ears.

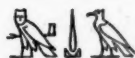
Dr. Pettigrew repeats more than once the statement that the bandages nearest to the body are always the coarsest. This is by no means invariable. I have often found fine cloth in direct contact with the body and layers of very various textures from this to the surface. In many, the linen was of the same texture all the way through.

Very few of the head bandages were continued over the shoulders except those closest to the body and occasionally those on the surface. In the whole mummies examined the limbs had been wrapped independently at first, then the head had been wrapped, and then the swathes of the body were applied. This is in accordance with the ritual. The fingers

<sup>1</sup> This is mentioned in the Papyrus of Ani, Pl. VIII, l. 26.


were swathed with linen from Saïs. On the left hand there should have been traced the figure of Hepi. The bandage of this hand is consecrated to Isis of Koptos, and the envelope was to be of six layers, with the figure of Isis, of Rā, and of Āmsu externally. That of the right hand bore the image of Nephthys, and was enveloped in twelve folds of bandages marked with the images of Rā, of Āāh, and of Isis and Nephthys. The bandages of the right arm are named those of Harmerui, of Āmsu-Āāh, and of Sept-Har, and all the bandages are consecrated to Har-hut. The feet had the toes also bandaged, but not separately, and it is directed that two jackals are to be drawn facing each other on two pieces of cloth. These bandages are the bandages of Horus, lord of Hebennu for the left leg, and that of Anubis for the right leg.

The other bandages of the body, the bandage of Het-Āāh, made of the fine linen of Sent, the wrappings of Nehamtera and Ahai made of the linen of Panopolis, and the bandage of the royal house made of the linen of Hanes, I cannot identify. The shroud which enwraps the body was called the wrapping of Meh, a marvellous texture of Hebennu, a wrapping of linen from Edfou. The



*mātait* like its Coptic derivative *μοxε*, was probably in the first instance a girdle for the loins, or an abdominal bandage, although used for bandages in general as for the ear-swathe.

The methods described in the ritual were, however, not strictly carried out in any of my specimens, and there are in each case special peculiarities in the number and arrangement of the folds too numerous to specify. In one a wide cloth was wrapped round the head and gathered into a knot on the back of the neck. This may be one of the four large pieces, which the ritual ordains for the occiput. It is not often that the method of reversal so usually practised in surgical bandaging to make the successive folds lie evenly is used on the limbs, but I have twice seen it. The several folds were applied wet and smeared with adhesive material. I have been able to extract from them some of the *Kόμμι* or gum Arabic which Herodotus mentions as employed to fasten them, and

which was derived from the  *āsh* or acacia tree of the


Upper Nile. The surface must have been soft when these cloths were applied, for the texture of the cloth is impressed on the skin, which is indented by the crumples of the bandages.

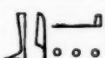
In general the skill of the Uti was exercised in making the surface of the bandages as smooth as possible, and it is probable

that each of these bandagers followed his individual taste in the process. With the deeper layers little care is taken to prevent crumpling, especially at the places where they cross, as on the nape or below the chin. The surface bandages lie evenly.

The ears are sometimes bandaged flat on the side of the head, but most commonly the folds of the bandage of Thoth pass alternately in front and behind the ear. There is in some cases an additional bandage applied over all vertically covering the ear completely. This, which was a double headed roller, is called "the completed." Sometimes a plug of cloth is forced into the fossa of the concha and the pinna bent forward over it.

The nostrils are commonly stuffed with a small horseshoe-shaped plug of linen, one end of which is driven up each. It is well known from the description of Herodotus that the brain was usually extracted through the nostril. This was done with a hook, which the Greek historian tells us was of iron. Bronze hooks have been found, which may also have been employed for the purpose. Chabas<sup>1</sup> figures a hook of three teeth of this metal, and there is an apparatus whose ideograph is well known,

and which has the phonetic value *kes* , which may have been used. Chabas also figures a knife seven cm. long, shaped like an

animal's thigh, which was made of  *baā*, presumed to

be iron. An instrument of this shape occurs in the symbolic representation of the ceremony of opening the mouth of the deceased in the tomb of Seti I, but there it is represented of monstrous size. It is named *Mesken*, and is said to have been of iron. A similar instrument is also named *Khopesh*.<sup>2</sup>

Extraction of the brain through the nose has been performed in 56 per cent. of my skulls. In five per cent. it has been done through the left nostril, in three per cent. through the right, in the others the septum was broken. In two the perforator had been driven through the basisphenoid, in one the brain had been extracted through the roof of the orbit. In some the membranes had been torn out with the brain, in others they remained; in general the operation was imperfectly done. In a few specimens bandages were driven up into the cranial cavity, but in general it was only the preserving material which had been inserted. I drew four yards of bandage out of one nose. In

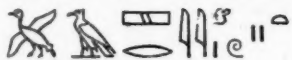
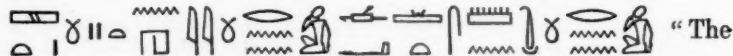
<sup>1</sup> "Études sur l'Antiquité Historique," p. 79.

<sup>2</sup> "Devéria, Mélanges d'Archéologie Égyptienne," 1 fasc., p. 2. Schiaparelli, vol. i, p. 105. Other unknown implements are named *Tuaur* and *Tuniſot*, *Ami* and *Neterti*.

another the whole cranial cavity was filled with rags; this condition was found in one mummy by Dr. Madden.<sup>1</sup>

The double method of preserving the nose by the inserted plug and by the facial swathes is probably referred to in the ritual.

The Ritual of Embalming mentions

 "The  
 "The

two nostrils, two bandages; *nehi*, name of the one, *smen* the name of the other." *Nehi* may be the plug, as the verb of nearly the same spelling means to separate, while *smen* may have been the bandage which conceals and fixes the organ.

In general particular care was taken in the preservation of the face. This was under the direct supervision of Hathor, hence the ritual says, "She comes to thee, Hathor, the beautiful face, she makes thy face perfect before the gods." They were not always successful, however. In one case the nose had been broken, and a clay nose had been made to support the bandage. In another the whole face, nose, jaws, and all had been broken, and the hole plugged up with clay on a basis of rags, and carefully bandaged over. In several the perforating instrument had been driven into the body of the sphenoid, and had not entered the cranial cavity, whereupon the embalmer had given up the attempt. One head had been cut off completely through the first cervical vertebra, and a stick of sycamore wood smeared with asphalte had been driven up into the head to peg it to the spine. The head had been cut off for me low down, and so well had the bandages been applied that it was not until we had stripped them off that we detected the pre-sepulchral decapitation. At this interval of time we could not determine whether the severance of the head had been effected after death or no.

In a good many, the orbits had been filled with finely chopped rags. Five of these mummies had had the contents of the orbit removed, in the others the rags were inserted under the eyelids and in front of the shrunken eyeballs. In most cases the eyelids were closed, or nearly so. In a fair proportion, however, they were open. In only one were there enamel plaques inserted.



The condition of the mouth was also variable. The ritual prescribes "two pieces for the mouth, two behind and two in front."




<sup>1</sup> Greaves records that "having caused the head of one of the richer sort of these embalmed bodies to be opened, in the hollow of the skull I found the quantity of two pounds of these medicaments which had the consistence, blackness, and smell of a kind of *bitumen* or pitch." In twenty of my heads the cranial cavity was quite filled with bitumen which had been injected through the nose.

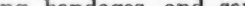


Lefronne supposed that all the Egyptian mummies had their mouths open, while the Græco-Egyptians had theirs shut. I have found the mouth shut in some mummies of all periods, but most commonly they have it slightly open, and the pressure of the bandages has forced back the lower jaw. In ten specimens, the vestibulum oris was filled full of small bits of linen over which the lips were tightly drawn. These stuffed out the cheeks, and, as the teeth were closed, none of the padding extended into the cavum oris. In one, cavum oris and pharynx were full of padding. In two the cavum and vestibule were filled with sand. In two the mouth was full of old cords twisted into a ball. One mummy had a small gilt piece of wood shaped like a heraldic shield fastened on its chin by asphalt, under the bandages. On the head of a child twenty months old, a little leather cap about 10 cm. in diameter was placed over the posterior fontanel under the bandages. In about ten of my specimens the mouth was filled with asphalt, in four with a powdery resinous aromatic material like powdered sandal wood and cassia.

The necessary closure of the mouth in the process of swathing was probably the occasion of an important subsequent portion of

the funeral ritual, the  "Ceremonial opening of the mouth of the Osiris." This is detailed at length in the texts published by Schiaparelli.

There are other bandages mentioned in the Papyri which I cannot identify, two called  "those that fill the two eyes of Rā," said to have been placed on the vertex, and another is called , "the ornamented

bandage." In the funeral inscription of Seti I, there is also the  *f*. The  *af*tu or "fourfold linen" is sometimes spoken of as if it were descriptive of a kind of wrapping, but I know not what was its nature. I am also unable to identify the  *sne*b mentioned in an inscription

quoted by Dümichen   "he is enveloped in the four *sneb* bandages of the linen  
*fer.*" In an inscription in the Louvre Anubis is represented  
holding two long bandages, and saying 





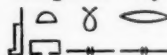




the head of a wrinkled, toothless old woman of extremely witch-like appearance, I was surprised to find that there was a considerable amount of hair of a lightish colour on the head under the bandages. On the application of warm water all this at once became detached and the locks proved to have been gummed on the surface of the head, which was bald and bare. One would like to have known something of the history of this prototype of Pope's "Narcissa." One lady had large masses of fair coloured hair much resembling in colour that resulting from the action of hydrogen peroxide. Another had a thick crop of moderately long black hair.

Whiskers and beard were usually shaven. I have only twice found anything like a distinct beard and moustache. Only one head was genuinely woolly like that of a negro; in many the hair was dark reddish brown, probably the result of the action of time and reagents. In many of the oldest heads the flesh had been removed from the skull and the bone carefully bandaged. The hair, when long, was usually cut squarely across the forehead, and there is often a median division. The wigs, which were probably worn during life, were not left on the heads, and in only one were the locks plaited. I did not find in any a trace of the conventional chin beard which in the monuments characterises men and the male gods, and which was, as the representations of it show, an artificial appendage tied on.

Summing up this detailed account of the mode of preparation, one is forced to the conclusion that the ritual method of enwrapping of the later time, as described in the papyri so often quoted, was only one of many ways in which the heads were enwrapped, and probably embodied a later tradition which had not been fully elaborated in the times before the dates of these papyri, or which, at least, was only used in all its details in a comparatively small number of cases, by the officials of the

 or "house of the bandages."<sup>1</sup>

#### DISCUSSION.

Dr. GAERSON said, in reference to the use of coarse cloth next the body which Prof. Macalister had mentioned he had met with sometimes in Egyptian mummies, it was not improbable that it was used designedly for the purpose of allowing a greater quantity of preserving medium to come in contact with the body than would be the case if fine texture cloth were used, as the interstices between

<sup>1</sup> None of my specimens showed the elaborate patterns of body bandaging like those found by Mr. Petrie at Hawara (p. 14). Since this Paper was printed I have received Dr. Budge's excellent book "The Mummy" (Cambridge, 1893), and Forrer's beautifully illustrated "Gräber von Achmim" (Strasburg, 1891), both of which contain additional information.

the threads of the coarse mummy cloth are larger than in the fine varieties.

As regards the removal of the brain through the nostril. This procedure was not practised in the earlier times, as in a series of twenty-three specimens of Egyptian mummies of the 4th Dynasty which he had examined, obtained by Mr. Flinders Petrie from Medum, in not a single instance had the brain been removed.

The removal and preparation of the scalp and its subsequent replacement, mentioned in the paper, is interesting from the fact that this procedure is followed in a part of the world very remote from Egypt, namely, in Mallicollo Island, one of the New Hebrides group.

Mr. STOPES confirmed Professor Flower's wish that Professor Macalister might visit Egypt, as notwithstanding the many observers who had already examined and reported upon that country, it would be a material benefit to Anthropology generally to have such skilled and searching criticism as would doubtless be given by him. When in Egypt, he (the speaker) had been struck when observing the remarkable differences in the linen that enwrapped the mummy cats at Siout, the apis and other mummies at Sakkara, and the great diversity of the qualities of the linen so profusely scattered on the desert at Thebes and at the tombs of the kings in the valley of Bab-el-Moulouk. It did not seem that the quality or fineness of the linen was a reliable index to the status of the mummy when in life. The fact that in some of the mummies of the very early dynasties, linen of such exceeding fineness was employed, was indicative not only of the high development to which weaving had at that time attained, but of the great length of time needed for such development in the art. Such wonderful workmanship needed generation after generation of skilful workers. Practically there has been little or no improvement in the quality of some linen manufactures for upwards of 4,000 years.

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#### DESCRIPTION of TWO SKULLS from NAGYR.

By W. LAURENCE H. DUCKWORTH, B.A., Scholar of Jesus College, Cambridge.

To the Cambridge University Collection there have recently been added two skulls from the capital of Nagyr, a small state in Central Asia.<sup>1</sup> By the kindness of Prof. Macalister I am enabled to give the following description of them:—

The skulls are numbered 1204 and 1205 respectively, in the Cambridge catalogue, the measurements which were made with

<sup>1</sup> The skulls were obtained by W. M. Conway, Esq., during his late mountaineering expedition in the Hindu-Kush district.

Flower's Craniometer and a steel tape, are given in millimetres.

The skull 1204 is a female skull whose sex is indicated by an inconspicuous glabella, faintly defined superciliary ridges, temporal ridges and external occipital protuberance, slender zygomatic arches. It is in a good state of preservation, the left side being a good deal more bleached than the right; no remains of skin or adhering hairs are to be seen. The more conspicuous parts missing are as follows: the lower jaw, all the teeth except four (first and second molars on either side), the lachrymal bones, the hamular processes of the internal pterygoid plates, the left styloid process (that on the right side though quite short (8 mm.) does not appear to have been broken off). The os planum of the ethmoid is much damaged on either side.

This skull is fairly symmetrical; the right parietal eminence is the more pronounced; on the left side is a parietal foramen.

At the right asterion are three large wormian bones, and at the left asterion a single one. The temporal ridge of the right side is more pronounced than that on the left (and the remaining molar teeth of the right side have larger dimensions than those on the left). There is a post-condylar foramen of large size on the right side, in front of and external to which is a remarkable eminence perforated at the top where the bone is thinned out. This is due to pressure of the right sigmoid sinus causing absorption of the bone and consequent dilatation of the sinus in this region (just before its termination). The anterior condylar foramina are large but neither is subdivided. The foramen spinosum is incomplete on either side, but this is possibly due to injury. The nasal bones are curiously asymmetrical. The suture between them is oblique in direction and at its highest point is 3 mm. to the left of the remaining trace of the metopic suture, whereas its lower end reaches to the middle line of the face; the width of the nasal bones at their upper ends varies correspondingly, for the right nasal bone is 6 mm. and the left, 4 mm. wide at this end. The anterior opening of the nose is also asymmetrical, the right superior maxillary bone being hollowed out to a much deeper level than is the left; the septum of the nose is strongly deflected to the left.

The dentition has been perfect. The premaxillo-maxillary suture is still visible; the sagittal suture shews no signs of synostosis nor has the spheno-basilar suture yet synostosed. These facts assign an age of from 18 to 21 years to this skull.

The general shape and contours are of a refined type, the forehead being high, no prominent glabella, distinct frontal eminences with a slight flattening immediately posterior to these. The curve of the vault reaches its culminating point

just at the bregma and begins to descend some 40 mm. posterior to this point. From the obelion, the posterior curve continues to the lambda, after passing which it is interrupted by a considerable bulging out in the region immediately above the inion.

In *norma verticalis* the skull is seen to be cryptozygous and dolichocephalic. The breadth-index, 69.94 is remarkably low. There is a depression at the level of the upper part of the temporal ridge, below each parietal eminence, below which again is an eminence above the mastoid process and it is at this level that the breadth of the skull is greatest. The transverse arc is quite regular, no flattening or upraising at the vertex. The mastoid processes are small, in fact feminine, and the same description applies to the face generally.

The coronal, sagittal, and lambdoid sutures are of moderate complexity. In the coronal suture just above the left stephanion appear the remains of a wormian bone, interrupting the suture for some 15 mm.; ossification has taken place around the circumference for about half its extent. The sagittal suture becomes more simple for a space of 25 mm. in the region of the obelion. The lambdoidal suture is characterized by the wormian bones already referred to. On the right side there is a large foramen in one wormian bone and another in the base of the mastoid process.

On the left side are two foramina near the base of the mastoid process, formed by the juxtaposition of notches in the borders of the temporal and occipital bones respectively. The metopic suture persists for a distance of 2 mm. only.

This skull weighs 419 gms.; decidedly light. The cranial capacity (using No. 8 shot) is 1470 c.c., an exceptionally high figure for a female skull. As regards the face; the orbits are mesoseme, and droop slightly and externally; there are shallow supra-orbital notches. The nose is mesorrhine and the lower margins of its anterior opening are rounded, the spine is small and the profile outline is nearly straight. There is a well marked depression immediately below the infra-orbital foramen. The palate is distinctly elliptical, of no great depth; the posterior nares are small. The occipital condyles are small, their inner and anterior lips are prominent and not much elevated above the plane of the foramen magnum.

An internal occipital protuberance can be felt and the torcular herophili seems to have been situated on its left side.

Turning now to the skull No. 1205, a series of contrasts present themselves. No. 1205 is a male skull—the prominent glabella, superciliary ridges, occipital protuberance and mastoid processes as well as the stoutness of the zygoma, indicate this. It is not in so good a state of preservation as is No. 1204, and



the following parts are wanting :—The lower jaw, styloid processes, right internal pterygoid plate, left hamular process, left inferior turbinated bone, the posterior part of the vomer and the left lachrymal bone. Three teeth alone remain and the alveolar arch has undergone a considerable amount of absorption.

The most striking features are : the rough and uneven surface; very marked dolichocephaly (index 68·28), considerable flattening in the region of the obelion, where there are two parietal foramina; the skull is also slightly plagiocephalic. There are two wormian bones on the right side below the asterion. The appearance of the condyles is noticeable. The left condyle is subdivided by a somewhat oblique sulcus so as to present two oval articular areas. The articular surface of the right condyle is constricted, at about the same level, but is not completely interrupted.

There is a post-condylar foramen on the right side. The outer pterygoid plates are much everted and on the left side a bridge of bone connects the base of the external pterygoid plate with the base of the spine of the sphenoid. This is the superior variety of the pterygo-spinous ligament ossified. On the right side a depression exists immediately external to the external pterygoid plate.

The age of this skull is not very closely indicated. The third molars on either side have been lost and their alveoli closed and since ossification is just commencing in the sagittal suture in the region of the obelion, it may be assumed that the person had passed middle age. The general contour is characterized by the very prominent glabella, with a depression immediately above it, the curve of the vault reaches its maximum about 25 mm. posterior to the bregma, and the region of the obelion is much flattened as has been already remarked. Beyond the lambda there is a considerable bulging out of the occipital bone, reduced at the occipital protuberance, whence a well marked occipital crest descends to the opisthion. Altogether this contour is somewhat irregular, contrasting strongly with that of No. 1204.

On a horizontal plane, *i.e.*, in norma verticalis the skull is seen to be phænozygous, and its left side is somewhat flattened. The transverse arc in the region of the coronal suture is quite regular. Posterior to this, the highest point of the arc is seen to be at a distance of 17 mm. to the left of the middle line; still more posteriorly this arc is interrupted by the flattening in the region of the obelion.

The sutures are moderately complex. The outline of the squamous portion of the left temporal bone overlapping the parietal bone, is noticeable as it culminates in a sharp spine vertically above the external auditory meatus; on the right



side the outline of the corresponding suture is more regular. The remaining teeth are of large size and shew signs of having been well used. The cranial capacity, 1375 c.c. and the weight, 667 gms., afford contrasts with the skull No. 1204.

The orbits are mesoseme; though their respective indices differ considerably; there is a supra-orbital notch on the right side and a supra-orbital foramen on the left side. The lower margins of the anterior nares are rounded; the nose is mesorrhine inclined to the leptorrhine type; the nasal spine is large. The alveolar index shews that the skull is orthognathic, but is not reliable owing to the absorption of the alveolar arch, the effect of which, aggravated by the length of time that has elapsed since the skull was interred, is to reduce the basi-alveolar length. The palate seems to have been elliptical. Traces of a premaxillo-maxillary suture remain, but these are lost near the middle line of the palate.

There is a somewhat large foramen in the basi-occipital on the lip of the foramen magnum midway between the condyles, corresponding to the attachment of the suspensory ligament of the odontoid process of the axis. The internal occipital protuberance corresponds in position with the external, and the torcular herophili was situated on the right side of this point.

Such are the characters of the two skulls. The contrasts between them arise rather from differences of sex and age than from any other causes. Their type is Caucasian in spite of the low figures representing their respective cephalic indices. There may be compared with them the following examples:—

First, the series of skulls from the Hindu-Kush, described by Dr. Garson in 1888. (i.) These came from localities at distances from Nagyr of thirty to one hundred miles. Of the five skulls two are dolichocephalic, the remainder are mesaticephalic; the most dolichocephalic had a breadth index of 72.3, and a general comparison of their measurements with those of the two Nagyr specimens brings to light a general resemblance.<sup>1</sup>

Secondly, there are two skulls from Srinagar (the capital of Kashmir), briefly described by Capt. Cunningham (ii.) in 1854. Sketches of the two skulls (a male and a female) are given, and the difference between these skulls and the shorter skulls with wider zygomatic arches of tribes more Mongolian in type is noticed. No measurements, however, are given. From the sketches, a general resemblance to the Nagyr skull is apparent, more particularly as regards the shape of the palate in the

<sup>1</sup> Dr. Garson has remarked on the prominent brow-ridges common to the Nagyr skull, No. 1205, and to the Hindu-Kush skulls, also on approximation of the cranial capacity in one case.

female skull. The same sketches are referred to in the "Crania Ethnica" of Quatrefages and Hamy.

In the third place, are the skulls presented to the Société Anthropologique de Paris by M. de Ujfalvy in 1882 (iii.); they are described as having been obtained from a Mussulman cemetery in Kashmir. A committee was appointed to examine and report on the skulls, but so far no report has been available.

Turning to measurements on living persons there may be mentioned M. de Ujfalvy's account of a native of Hunza whom he measured. (iv.) This man was dolichocephalic with a cephalic index of 73·84. To obtain the corresponding index for the skull itself, two units should be subtracted according to Broca ("Bull. Soc. d'Anthrop.", 2nd series, vol. iii., 1868). The resulting index of 71·84 is quite comparable with the foregoing instances. M. de Ujfalvy at the same time took measurements of a native of Naghar (? Nagyr), but these were not placed on record in the Society's report.

Such are the cases for direct comparison. On looking through the catalogue of the museum of the Royal College of Surgeons, the following crania from Hindustan seemed to present points of similarity to those from Nagyr, viz., Nos. 632, 634, and 670; their measurements have been tabulated with those of the Nagyr skulls (Table II).

As to the character and mode of life of the inhabitants of Nagyr, there is some little diversity of opinion expressed by travellers. The name is almost invariably coupled with that of Hunza; Nagyr and Hunza are the chief towns of two small states (of the same names respectively) and are situated on opposite sides of a tributary of the Gilgit river. The whole district is also referred to as Kanjut, and is on the frontier between Kashmir and the Pamirs. Of the inhabitants of Hunza, but one opinion is expressed: that they are dangerous brigands. This description has been extended to the natives of Nagyr by some writers; others assign to them a more peaceful occupation.

Of modern writers, the traveller Vigne, in 1842, referred to the goldwashing carried on at Nagyr, and also to the renowned beauty of the women (v.)

Capt. Cunningham (*op. cit.*, (ii.) p. 38) says, "Hunza-Nager is a small tract of country situated on the upper course of a large feeder of the Gilgit river." . . . "I presume that this district was formerly inhabited by the Dards, and that they were displaced by the Kirghiz nomads." The cranial characteristics of the Kirghese described by Topinard ("Revue d'Anthropologie," 1887), do not support this view.

In 1869 Dr. Leitner made the first of a remarkable series of

contributions to the literature of this subject. In a communication (vi.) to the Anthropological Society in this year (1869), Dr. Leitner stated that, "Khajuna is the remarkable language of Hunza and Nagyr." . . . "Although not unacquainted with a variety of languages, I was unable to find any connection between the language of Hunza-Nagyr, and that of any other country." . . . "The people of Dardistan seem to have the remnants of an old civilization somewhat resembling the purest parts of the Aryan polity. This has, however, been obscured by the introduction of Mohammedanism into the country." . . . "the position of woman is in every respect higher than among the Hindus."

Other writings of the same author describe the Nagyris as "short and stout, and fairer than the people of Hunza," who are described as "tall skeletons," and are "desperate robbers," and again "the people of Nagyr are a comparatively mild race; they carry on goldwashing," with historical references to this occupation of the Dards by Herodotus, Ptolemy, and native Kashmirian chroniclers (vii.).

Other accounts (viii.) published by Dr. Leitner (including the "Hunza and Nagyr Handbook," 1889) give additional information, but are perhaps rather of philological interest. In 1891 (ix.), reproductions of photographs of Nagyris were published, and it was stated that "Hunza and Nagyr are but one tribe divided into two rival sections." Still more recently the difference in character of the two are strongly insisted upon (x.). Dr. Leitner hopes to publish a series of measurements of this people which will doubtless be of much value.

Other descriptions of the Dards are given by Drew (xi.). They are supposed to have come from the North and North-east (reference to Sir G. Campbell's work being made). The same author (xii.) again says: "Whether we judge from language or physiognomy, the conclusion is inevitable that the Dards are an Aryan race." Their castes are enumerated; the Shins and Yashkuns being regarded as the most ancient, and as composing the race, called Dard, that invaded the country, and took it from earlier inhabitants. The Yashkun without any Shin are found in Nagar.<sup>1</sup> Gen. Maclagan (xiii.) considers these tribes as Aryan. Lieut.-Gordon (xiv.) states that the people of Hunza and Nagyr are alike in character and religion and describes them as having "an evil reputation with their neighbours, as robbers and man stealers, treacherous, cruel, and cowardly."

The description of a native of Hunza, by M. de Ujfalvy, has

<sup>1</sup> Mr. Conway, however, says "the people are something of a mixture (Yashkuns, Shinas, and lower caste of earlier folk)." Letter to Prof. Macalister.

been referred to (iv.). M. de Ujfalvy thought this man resembled the natives of Herzegovina.<sup>1</sup> The features were thus described "des sourcils épais allant sans interruption d'une bosse sourcilière à l'autre; des bosses sourcilières peu prononcées, et la dépression entre le nez et la glabelle, presque nulle"; the profile resembled that of a Greek statue.

In a review of Dr. de Ujfalvy's "ethnologische Beschreibung der Völker Central Asiens," the author's classification of these races is appended, in which the "Khadschuna" are placed in a subgroup under the group "Die Hindu-Kusch Inder"; while "Die Darden" fall within another subgroup under the same group (xv.)

Sir W. W. Hunter (xvi.) thus notices this people, "The people of Hunza and Nagyr belong to the caste called Yeshkún by the Shins of Gilgit, but known among themselves as Búrish. . . Mohammedanism sits but loosely upon them"; while Dr. G. Capus (xvii.) refers to Tomaschek's opinion that "la peuplade des Kachounas dans le Dardistan sout un reste de ces aborigènes non-ariens parce qu'ils possèdent, ainsi que les Kafirs, les Daradas, et certains Tadjiks de la montagne, une méthode de compter vigésimale." A general account of the tribes of this district is given by Prof. E. E. Oliver (xxi.), and reference to the appearance of the Hunzas by Mr. E. F. Knight (xxii.).

Dr. Leitner, as has been said, described the language spoken by the inhabitants of Hunza-Nagyr as unconnected with any of the neighbouring dialects. On this subject the following light was thrown by Dr. Hyde Clarke (xviii.). This language (the Khajuna) was for some time unclassified since it has no neighbouring congeners. The group of languages furnishing the key to it has representatives in Abyssinia, Caucasia, and the Indian Archipelago; a Siberian class and two American classes are also related, as is also the Rodiya or language of the Pariahs of Ceylon. This group, the Sibero-Nubian, must have had possession of the whole of India before the advent of the Dravidians. Col. Biddulph classifies the languages of Dardistan thus: (1.) Boorishki or Khajuna . . . the language of the Boorish or Yeshkuns spoken in Hunza, Nager, and Yassin; (2.) Shina, spoken at Gilgit; (3.) Khowar, the language of Chitral (xix.).

M. de Ujfalvy says the language of Hunza-Nagyr is non-aryan, and (presumably) separates the "Khadschuna" from other Dards. He refers to the opinions of Tomaschek and Biddulph,

<sup>1</sup> The Hunza man had a cephalic index of 73·84; whereas in a summary of the Anthropology of Herzegovina, Dr. Weisbach (Vienna) describes the natives of the latter country as Hyper-Brachy-cephalic (index 87·2). "Revue d'Anthrop." 3 Série, Tome iii, 1888, p. 742.

as to the meaning and origin of the terms "Khazunah" and "Burich" respectively (xx.).

In accordance with the affinities of the Khajuna language as described above, a comparison has been instituted between the measurements of the Nagyr skulls on the one hand, of those of various natives of Ceylon on the other. A general review of the figures shows that the two Nagyr skulls resemble each other more closely than any of the skulls compared with them (see Tables III. or IV.); the most interesting comparison is afforded by the data for the Rhodias of Ceylon (presumably the Rodiya mentioned by Dr. Hyde Clarke).

TABLE I.

MEASUREMENTS OF THE SKULLS ARE IN MILLIMETRES.

INDICES.						Skull, ♀ Nagyr, 1204.	Skull, ♂ Nagyr, 1205.
(Bi) Cephalic..	..	..	..	..	..	69·94	68·28
(Hi) Vertical..	..	..	..	..	..	69·94	70·43
(Ai) Alveolar..	..	..	..	..	..	95?	97·10?
(Oi) Orbital..	..	..	..	..	..	86·43 (R)	82·06 (R)
(Ni) Nasal..	..	..	..	..	..	50	52·72
Stephano-zygomatic..	..	..	..	..	..	97·5	82·4
Palatine..	..	..	..	..	..	115·4	..
Naso-malar..	..	..	..	..	..	110·50	113·33

CRANIAL CAPACITY.						1470 c.c.	1375 c.c.
Maximum Antero-posterior Length	..	..	..	..	..	183	186
Maximum Transverse Diameter	..	..	..	..	..	128	127
Basi-alveolar Length	..	..	..	..	..	95?	101?
Basi-nasal Length	..	..	..	..	..	100	104
Basi-bregmatic Length	..	..	..	..	..	128	131
Length: Basion to Inion	..	..	..	..	..	63	87
"    Opisthion	..	..	..	..	..	31	38
"    Opisthion to Glabella	..	..	..	..	..	137?	144
"    Nasi-alveolar	..	..	..	..	..	60	75?
"    of Spheno-parietal suture	..	..	..	..	..	10	15 R 17 L
Breadth of Foramen magnum	..	..	..	..	..	27	29
"    from Pterion to Pterion	..	..	..	..	..	104	112
"    from Stephanion to Stephanion	..	..	..	..	..	117	103
"    from Asterion to Asterion	..	..	..	..	..	105	104
"    Bizygomatic	..	..	..	..	..	120	125
"    Bi-maxillary	..	..	..	..	..	89	96
"    Interauricular	..	..	..	..	..	107	113
"    Minimum Interorbital	..	..	..	..	..	19	22
"    Minimum Frontal..	..	..	..	..	..	101	95
"    Bi-orbital (at Fronto-malar suture)	..	..	..	..	..	102	101
Orbital Breadth	..	..	..	..	..	37	39
Orbital Height	..	..	..	..	..	32	32



TABLE I—continued.

						Skull, ♀ Nagy, 1204.	Skull, ♂ Nagy, 1205.
Nasal Breadth	..	..	..	..	..	22	29
Nasal Height..	..	..	..	..	..	44	55
Maximum Length of the Palate	..	..	..	..	..	52	57?
Maximum Breadth	..	..	..	..	outside arch	60	64
"	"	"	"	"	inside arch	42	45?
Arcs:—							
Antero-posterior curve.	Frontal arc..	..	..	..	..	129	123
	Parietal arc	..	..	..	..	125	122
Arc from Lambda to Inion	..	..	..	..	..	88	65
"	Inion to Basion	..	..	..	..	63	94
"	Inion to Opisthion	..	..	..	..	32	55
Supra-auricular arc	..	..	..	..	..	302	307
Jugo-nasal arc	..	..	..	..	..	105	110
Breadth at external border of Orbits for Naso-							
malar Index	..	..	..	..	..	95	98
Horizontal circumference	..	..	..	..	..	508	507
Posterior Nares—							
Maximum Breadth (between Intl. Pterygoid							
plates)	..	..	..	..	..	27	30
Height	..	..	..	..	..	23	23
Length of Interpalatine suture	..	..	..	..	..	14	17
The Superior Maxillary Bone—							
Maximum Height	..	..	..	..	..	57	72?
Mean Height	..	..	..	..	..	35	47
Minimum Height	..	..	..	..	..	17	23

## DIMENSIONS OF TEETH.

Skull, ♀ Nagy, 1204.

				Antero-posterior diameter.	Transverse diameter.
<i>On the Right—</i>					
Molar 1	..	..	..	10	11
Molar 2	..	..	..	9	10
<i>On the Left—</i>					
Molar 1	..	..	..	7	10
Molar 2	..	..	..	8	8

Skull, ♂ Nagy, 1205.

				Antero-posterior diameter.	Transverse diameter.
<i>On the Left Side—</i>					
2nd Premolar	..	..	..	7	8
1st Molar	..	..	..	11	11
2nd Molar	..	..	..	10	10

TABLE II.

COMPARISON OF MEASUREMENTS OF SKULLS FROM NAGYR with those of Skulls from the Hindu-Kush described by Dr. Garson (i.) and with isolated examples of Dolichocephalic Skulls which were obtained from other parts of Hindustan.

Skull.	Horizontal circumference.	Maximum Length.	Maximum Breadth.	Breadth Index.	Height.	Height Index.
Nagyr (1204) .. .. .	508	183	128	69·94	128	69·94
Nagyr (1205) .. .. .	507	186	127	68·28	131	70·43
Gound :						
No. 634 in the catalogue of the } Roy. Coll. Surgeons .. .. .	505	188	127	67·6	134	71·3
Hindu-Kush B .. .. .	515	181	136	75·1	128	70·7
" C .. .. .	483	177	128	72·3	123	69·5
" D .. .. .	500	178	134	75·8	129	72·5
" E .. .. .	508	176	140	79·5	127	72·1
" F .. .. .	490?	179	133	74·3	128	71·5
M. de Ujfalvy's Hunza (iv.) ..	?	?	?	73·84 (71·84)	?	?
Skull from Madura, 670 in cata- } logue of Roy. Coll. Surgeons ..	507	184	124	67·4	143	77·7
Skull of a Mussulman, 632 in cata- } logue of Roy. Coll. Surgeons ..	512	189	125	66·1	132	69·8

TABLE III.

COMPARISONS OF MEASUREMENTS OF NAGYR SKULLS with those of Living Rhodias.

Skull.	Cranimetric.		Anthropometric.	
	Nagyr, 1204 (female).	Nagyr, 1205 (male).	Rhodia (male).	Rhodia (female).
Antero-posterior diameter ..	183	186	190·66 (6)	181·66 (6)
Maximum transverse diameter ..	128	127	139·5 (6)	137·81 (6)
Cephalic Index. . . . .	69·94	68·23	73·16	75·86
Horizontal circumference ..	508	507	541·16 (6)	544·66 (6)
Minimum frontal breadth ..	101	95	106·16 (6)	94·83 (6)
Bi-zomatic breadth .. .. .	120	125	120 (12)	
Bi-auricular breadth .. .. .	107	113	117 (12)	
External Bi-orbital breadth ..	95	98	98·66	

The above measurements of Rhodias are given by M. Emile Deschamps in  
K 2

his account of "Les Veddahs de Ceylan," in "L'Anthropologie" for 1891; photographs of male and female Rhodias are also given; in the profile view of a Rhodia chief, the brow presents the same feature of prominent glabella with a depression immediately above it, as does the male skull from Nagyr. The figures in the table above, when allowance is made for the difference between Anthropometric and Craniometric observations, afford some interesting comparisons; those of the respective horizontal circumferences being remarkable. Topinard (xxv.) states that for a skull with a circumference of 508 mm. (horizontal) there should be added 35 mm. to approximate to the corresponding Anthropometric measurement. In the case of Nagyr, 1204, this would give 543 mm., and for Nagyr, 1205, the anthropometric equivalent would be 542 mm.

TABLE IV.

COMPARISON OF MEASUREMENTS OF SKULLS FROM NAGYR with those of Skulls of Natives of Ceylon other than Rhodias.

Skull.	Nagyr, 1204 ♀.	Nagyr, 1205 ♂.	Veddah ♂.	Veddah ♀.	Tamil ♂.
Capacity .. ..	1470	1375	1277 (22)	1139 (10)	1336 (13)
Height Index .. ..	69·94	70·43	73·8 (21)	73·2 (10)	73·6 (13)
Basi-Nasal Length ..	100	104	98·7 (18)	93·4 (8)	102·5 (13)
Basi-Alveolar Length ..	95	101?	94·2 (16)	88·3 (8)	99·7 (10)
Alveolar Index .. ..	95	97·10	95·2 (16)	94·5 (8)	97·7 (10)
Orbital Index .. ..	86·43	82·06	89·2 (21)	89·4 (10)	86·7 (10)
Interorbital breadth ..	19	22	22·2 (21)	21·7 (10)	23·5 (13)
Nasal Index .. ..	50	52·72	52·5 (21)	52 (8)	53·7 (13)
Cephalic Index .. ..	69·94	68·28	71·6 (21)	71·2 (11)	70·8 (13)

The measurements of the Veddah and Tamil skulls are those given by Drs. Paul and Fritz Sarasin (xxiv.). The numbers in brackets indicate the number of skulls whence the average is deduced.

Dr. Deniker has most kindly communicated detailed measurements of the series of skulls of Cashmiris, presented to the Société Anthropologique de Paris by M. de Ujfalvy. The series comprises six skulls of males and three of females. Apart from measurements, Dr. Deniker says that the prominence of the inferior nasal spine and the shape of the apertura pyriformis of the nose (that of an ace of hearts), are characteristic of this series. For the measurements, the following arrangement exhibits the principal features, with which those of the skulls from Nagyr may be compared:—

Skull.	Breadth Index.	Height Index.	Nasal Index.
Nagyr, 1205 .. .. .	63·28	70·43	52·7
Average of five male skulls from Cashmere .. .. .	73·28	70·7	48·3
Extremes .. .. .	75·6	73·4	54·7
Cashmere skull, No. 9 (male) ..	70·6	65·8	41·5
	65·6	67·2	?

No. 9 is described separately, as Dr. Deniker suspects deformity.

## FEMALE SKULLS.

Skull.	Breadth Index.	Height Index.	Nasal Index.
Nagyr, No. 1204 .. .. .	69·94	69·94	50
Cashmere, No. 5 .. .. .	72·3	74·7	51·1
" No. 6 .. .. .	74	70·7	43·8
" No. 4 (Child?) .. ..	75·9	77·7	54·5

The conclusion is, that the skulls from Nagyr might well fall into a group including these skulls from Cashmere, except as regards their breadth-index, though even this pronounced feature is surpassed by one of the Cashmere skulls. It seems probable that this may prove to be a specific distinction of skulls from Hunza-Nagyr.

## REFERENCES.

- i. Dr. J. G. Garson. "Journal of the Anthropological Institute." Vol. XVIII. 1889.
- ii. Capt. Cunningham. "Ladakh and the surrounding countries." 1854.
- iii. M. de Ujfalvy. "Bulletin de la Société Anthropologique de Paris," 3<sup>e</sup> Série, Tome V. 1882. p. 212.
- iv. M. de Ujfalvy. "Bulletin de la Société Anthropologique de Paris," 1881. p. 600.
- v. Vigne. "Travels," 1842. Vol. II. p. 288.
- vi. Dr. G. W. Leitner. "Journal of the Anthropological Society." Meeting of Nov. 30th, 1869.
- vii. Dr. G. W. Leitner. "Indian Antiquary." Jan. 5th, 1872. p. 8.
- viii. Dr. G. W. Leitner. "Report of the British Association." 1875. p. 176.
- ix. Dr. G. W. Leitner. "Asiatic Quarterly Review." New Series. Vol. II. July, October, 1891. pp. 139, 204, 243.
- x. Dr. G. W. Leitner. "Asiatic Quarterly Review." New Series. Vol. III. January, April, 1892. p. 53.
- xi. Drew (F.). "British Association Report." 1874. p. 149.
- xii. Drew (F.). "Northern Barrier of India." 1877. p. 167.
- xiii. Gen. MacLagan. "Encyclopædia Britannica." Article "Kashmir."
- xiv. Lieut. Gordon. "The Roof of the World." 1876. p. 139.

- xv. "Archiv für Anthropologie." Vieweg u. Sohn Braunschweig. Band 17 1887.
- xvi. W. W. Hunter. "Imperial Gazetteer of India." 1886. Vol. V. Article "Gilghit."
- xvii. Dr. G. Capus. "Revue Scientifique." III<sup>e</sup> Série. Tome XVII. Jan. to July, 1889. p. 7.
- xviii. Dr. Hyde Clarke. "Indian Antiquary," 1872. August 2nd.
- xix. Col. Biddulph. "Journal of the Royal Asiatic Society." Vol. XVII. New Series. 1885.
- xx. M. de Ujfalvy. "Bulletin de la Société Anthropologique de Paris." Séance du 16 Mars, 1882. p. 226.
- xxi. Prof. E. E. Oliver. "Pathan and Biloch." 1890. pp. 320-327.
- xxii. E. F. Knight. "Where three Empires meet." 1893. (Longmans).
- xxiii. Emile Deschamps. "Les Veddas de Ceylan." L'Anthropologie. 1891.
- xxiv. Paul and Fritz Sarasin. "Ergebnisse Naturwissenschaftlicher forschungen auf Ceylon." 1893.
- xxv. Dr. P. Topinard. "Eléments d'Anthropologie Générale." 1885. p. 711.
- xxvi. Biddulph. "Races of the Hindu-Kush."

## DISCUSSION.

Dr. GARSON remarked that the specimen of the male cranium agreed very closely in its characters with a series of five crania described by him in the Journal of the Institute in 1888, from the same district. One of the most noticeable characters of the skull is the great development of the supra-orbital region, which forms, as it were, a prominent bar across the forehead. About four years ago he had an opportunity of seeing some photographs of the people, exhibited at the Institute by Dr. Leitner, of Woking, which showed that this feature is equally characteristic of the living subject. He handed round a photograph which had been presented him by Dr. Leitner, of a group of natives of different tribes from the place where the skulls were obtained. Specimens from this region of Asia are very difficult to obtain, and consequently their affinities to neighbouring nations are little known. From his examination of the specimens he had described he had come to the same conclusion as Mr. Duckworth, viz., that there was certainly no trace of Mongolian affinities in them. The average cranial capacity of four of his specimens was exactly the same as that stated by Mr. Duckworth to be the capacity of the male cranium. The female cranium on the table was the first one of that sex he had seen.

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DAMMA ISLAND *and its* NATIVES. By P. W. BASSETT-SMITH,  
Surgeon R.N.

[WITH PLATES VIII, IX.]

IN November, 1891, while serving on board H.M. surveying ship "Penguin," it was my good fortune to visit Damma Island, one of the largest of the Serwati group in the Banda Sea, in latitude 7° 08' S., longitude 128° 40' E.



It is almost half way between Timor and Tenimber Island (Timor Laut), and is also almost intermediate between Port Darwin and Amboyna, being thus passed en route from the former place to Hong Kong. An occasional trading steamer calls at this island, as at Tenimber, and it is nominally ruled by the Dutch; the only official representative, however, was a "Postholder," an ancient Macassar man, who came off to the ship wearing a black coat and fez, carrying a gold-headed stick, bearing on it the Netherlands arms; but he was very poor, and eagerly accepted biscuit, or anything else that was offered to him; with him were his family and a few other Malays, who all lived together, and from them I gathered that there was very little fever in the island, and not much game. These younger Malays occasionally acted as guides, yet I believe the island is practically unknown to Europeans, and the racial character of the inhabitants doubtful. The only mention I have been able to find of them being in Stanford's Compendium, "Australasia," where Mr. Wallace states that they are like those of Wetter Island (which is a little further west), who again are like those of Timor, and therefore probably belong to the sub-Papuan type; this being so, our visit was particularly interesting, and as many facts and observations, as well as Natural History and other specimens, were collected during our short stay of five and a half days as possible. But one cannot too strongly bear in mind Mr. Wallace's caution as to the drawing inferences, or speaking dogmatically of the exact nature of the races of these islands, without long residence among them, and especially without some knowledge of the languages. These people, however, certainly present many marked peculiarities and interesting points, which might be expected from their geographical position between the great Malayan Islands and New Guinea, ethnologically so distinct.

The island is of an irregular horse-shoe shape, about eight miles in diameter, irregularly and highly mountainous, having a lofty truncated peak at the northern end, which is constantly smoking, and on its eastern side the upper third shows bare and stratified layers of lava, with here and there large patches of sulphur; below which is dense forest, which also, as far as I saw, seemed to cover the whole island, resembling much the Molucca Islands in the profuse vegetation.

On the east side is a natural harbour, "Koelewette," where the ship anchored, deep water being obtained close up to the shore, with a muddy bottom; the margin being fringed with coral reefs going steeply down, from 6 fathoms. A very delicate *madrepora*, like *capillaris*, was obtained in quantities, together with many others in 2 to 4 fathoms. At the head

of the bay was an extensive mud-topped reef, on which were a few unhealthy corals, chiefly *goniastrea* and *tubipora*, the shore line being fringed with mangroves. The largest village on this side was situated here surrounded by a cocoanut plantation. In it there were about fifty houses or dwellings, enclosed by a dry-stone wall, having a wooden ladder for means of entrance and exit; a curious carved wooden figure raised high up on a post was found at the back.

By this village, which was called Solla, was a fine clear stream, and on either side of it were sago plantations, the water being used to wash the sago, in machines which were like those found in Ceram, and figured in "The Malay Archipelago"; these were numerous, and met with all over the island, the heaps of refuse, however, have a strongly offensive odour. Many bread-fruit, jack-fruit, mango, and cotton trees, bananas, and pineapples, with cocoanut, betel nut, ratan, and other palms were plentifully seen close by, the forest round was very dense with great numbers of acacias and *Ficus* spp., and very thick undergrowth, making travelling through it most difficult, and impossible without a native guide; near the mouth of the stream was a boat-building shed, and, from the amount of chips and *débris* round, they must do a good deal of work; some distance up nature was charming; the cool clear water ran quickly over its rough bed of boulders of hard basic lava rocks, in small rapids, the high and steep banks on either side being more or less covered by splendid ferns, and here and there a bright scarlet-coloured *hibiscus* flower showed, all overhung by great forest trees, bearing their burden of creepers and epiphytic plants, which shaded the hot glare of the tropical sun; in the clear air, numbers of small swifts sailing above, or a bright-coloured kingfisher darting by below, made a most delightful scene, and often near to, the deep "booming" of the great fruit pigeon, *Carpophaga concinna*, Wall., or a very closely-allied species; or a flight of lorries, screaming loudly as they went by, would be heard.

In the pools were many large prawns, and I was much interested in seeing a bright-eyed native boy catching them; breaking off a small palm leaf, he made out of the mid-rib a couple of supple wands, each terminating in a noose. In one he placed a small piece of meat as a bait, with which the creature was lured from its hiding-place under the rocks, the second noose was then dexterously passed over its tail, and both quickly drawn out; I tried for a long time, but was never quite successful.

The first three days after our arrival, in company with Lieutenant Parry and a marine, I made an expedition round the side of the mountain to collect birds, etc., and if possible, to get

up to the top. The rock at the base was a trachytic lava, and in places where there were any streams and springs, they were found to be quite hot, too hot to bear one's hand in for a moment. Many were at the shore line, but some being between tide marks; in one, cuttlefish and birds were cooked sufficiently for the natives to eat. After marching nearly all day through forest, more or less dense, we came upon a village, about one-third of the way up the mountain, where we camped; it much resembled the one at the head of the bay, being walled all round, and having a plantation at the back, of cocoanut, betel nut, and bread-fruit trees. The huts were built of bamboo, *not on piles*, the walls covered in with laths, generally quite down to the ground, having a gable roof of thatch. Inside, each had a shelf, or floor at the level of the springing of the roof of split bamboo, on which they slept, there being no furniture of any sort. Over the doorway were carved grotesque figures of men and animals; the huts were arranged more or less regularly in rows, all being nearly equal in size; inside the compound were mango, jack-fruit and bread-fruit trees, with many bananas. We soon created friendly relations, and a system of barter for eggs, fruit, etc., but they did not value money much; clothes, especially bright-coloured ones, being most coveted, as well as needles, pins, knives, matches, etc. They gave us a new but roofless hut to use, in which was a carved wooden bowl on a pedestal, over which was stretched tightly a deer skin; this drum they beat at sunrise and sunset. Outside was another carved post and figure [Plate VIII] 7 feet high, which I afterwards sketched, but as they strongly objected to my doing so, I had to finish it when most of the men were away in the daytime. In the middle of the night it poured with rain, and we were agreeably surprised when our next door neighbour came out, and invited us into his house, where we slept on the shelf among his numerous naked children, heartily glad of the shelter.

During our stay at this village they treated us quite as friends, and though rather inquisitive, were never troublesome, coming in and crowding round when we dressed, ate, or did anything; but although we left our belongings at other times unprotected, they never touched or stole anything in our absence. They made us understand that it would take more time than we could spare to get up to the top of the volcano, so I had to be content with shooting, etc., what I could in the vicinity; the density of the forest growth, and the want of paths making this a matter of great difficulty; the weather, too, was oppressively hot in the thick jungle.

*Natives.*—As far as I was able to make out there were two more or less distinct types. The first with dark brown skins,

coarse black hair, either straight, or with a tendency to curl, sometimes closely cut, roundish faces and heads, dark eyes, high cheekbones, nose much sunken at the base, nostrils dilated, mouth rather large, and lips much misshapen by betel-chewing, the bolus of which they kept half protruding in a disgusting way; body with but little hair, occasionally a short wiry beard and whiskers, height about 5 feet 6 inches, limbs well formed, ankles and wrists not particularly small, expression quiet and rather dull.

The second a coppery brown, much lighter race, with strong frizzly hair, either cut short, or standing out in a mop, coloured a rich orange yellow with lime, and evidently a great source of pride to them, face oval, eyes dark, sparkling, and full of life, nose aquiline, often slightly hooked at the tip, nostrils wide, mouth small, lips well cut, no hair on the face, at least, not when young adults, teeth good, expression bright and intelligent, limbs well shaped, rather delicate wrists and ankles, average height 5 feet 5 inches, or under; some of these were so graceful and handsome as to fill anyone who observed them with admiration; it was not a single individual, but numbers of them, and one instinctively made friends with their bright faces and ways. I was myself quite charmed. The former we found mostly in the coast villages, the latter on the hill side. In the former the low nose, straightish hair, thick lips, round heads, and high cheekbones, with general dulness of expression, point to Malayan origin, though the presence of curling in the hair, in some, and strong wiry beard, showed probable mixture of blood. In the second type the light colour, hairless faces and short stature are unusual in Papuans, yet the strong frizzly mop of hair, handsome faces, aquiline and slightly hooked nose, and general brightness of disposition very strongly favour that origin. Probably they are of a very mixed race, the inhabitants of Ceram and Bouru having spread south and intermingled with true Papuans from the east and Malays from the west.

The women were shorter in stature, with their hair done up in a knot at the back of the head: when young they were pleasant to look at, but apparently soon aged, and with their very pendent breasts were ugly: as a rule they did not leave the houses much while the men were in the compound or enclosure.

The average measurements of the hillmen I obtained were:

Height.	Length of head.	Width.	Cephalic Index.	Length of arm.	Length of leg.
5 ft. 5 ins.	7 $\frac{4}{16}$ ins.	6 $\frac{1}{16}$ ins.	82	32 ins.	35 ins.

*Language.*—The following words I collected from the hill or Papuan people:—

- |                    |                              |
|--------------------|------------------------------|
| 1. <i>Sarrah.</i>  | 9. <i>Worsi.</i>             |
| 2. <i>Wooruh.</i>  | 10. <i>Woosarrah.</i>        |
| 3. <i>Wortel.</i>  | 11. <i>Woosarrah missa.</i>  |
| 4. <i>Worwart.</i> | 12. <i>Woosarrah wooruh.</i> |
| 5. <i>Woolim.</i>  | 20. <i>Woo worruh.</i>       |
| 6. <i>Wornam.</i>  | 30. <i>Woo wortel.</i>       |
| 7. <i>Worit.</i>   | 31. <i>Wpowortel missa.</i>  |
| 8. <i>Wortu.</i>   | 40. <i>Woo wor wart.</i>     |

Man, *oomo*; woman, *hatu*; fire, *ai*; water, *manu*.

I obtained these from one who also spoke Malay. The "*ai*," for "fire," might be an abbreviation of "*api*," but the word for "wood" in the Ké Islands is "*ai*," and with the N.W. Australians, wood and fire are both expressed by the same word, the numerals, however, bear a striking resemblance to those of the Timor Laut people.

*Weapons.*—Bows and arrows were their principal arms, every man being usually provided with them. The bows were made of bamboo, taken from a large stem, and nearly flat, the string being of twisted hide (deer), the arrows were about 5 feet 6 inches long, the shaft being of light bamboo, *not* feathered, the extremity of dark wood, very hard, 1 foot long, secured into the bamboo by fibre: these are more or less barbed. There were also some with iron heads, which are, I believe, only used when fighting amongst themselves; for shooting fish, at which they are most expert, they use long arrows with three points, each strongly barbed. They had some spears with wide flat iron heads, or all wood with the extremity barbed; for cutting coconut and jungle they have small parangs or knives, probably brought by Malay traders. These were the only weapons I saw.

*Ornaments and Dress.*—Through their orange-coloured bushy hair the men often wore combs most ingeniously made out of bamboo, and highly ornamented with carving, beads, tufts of hair, etc., and from their ears, the lobe of which was often much elongated, hung pendants of either silver, tortoiseshell, black wood, or fish bone; around their wrists they had wood or bone bracelets, more or less ornamented: these were much too small for any European adult, the wooden ones were of a curious shape, and studded with little brass nails (see Plate IX, Fig. 3). They did not pierce the nose or, I think, file the teeth, neither were any tattoo marks or scars seen on the body.

For dress, the men wore a simple T-shaped waist cloth, the women a short petticoat, and the children generally nothing.

*Customs.*—The men chiefly hunt and fish, or are employed boat-building, making sago, etc., and are away from the village all the day, when the women and numbers of children seem to



swarm out; besides their household duties the women and boys collect fruit from the forest and plantations, and bring in water which they carry in joints of large bamboos.

The beating of the drum at sunrise and sunset was no doubt a religious rite, as the chief man of the village did it each time, beginning gently, and working up to a loud pitch; in the evening several natives used to come and beat a few notes quietly; they were very careful to cover it up, and did not like us to put our things on it; the wooden "gods" were typically Papuan, and were held in fear. I also noticed outside the first-mentioned village an ordinary shed-like structure, under which was slung a small canoe, in which was seated the figure of a man: this was probably the grave of a chief.

One evening we persuaded the men to dance by moonlight inside the compound; two pairs accordingly began, linked arm in arm facing each other, advancing and retiring, singing and stamping: they were soon joined by others, until there were at least fourteen in two rows, their arms round the neck or waist of the next man. At first it was a slow measure, stamping and singing to a sort of chaunt, in perfect unison, but to a time which was most difficult for a European to pick up, this, after a time quickened, when they stamped up much dust; there being a sort of recitative, and two choruses ending by "kāki" and "sāli," which they uttered with the full force of their lungs, making the echoes ring again during the height of the dance. Most of the men and women turned out, and seemed very pleased when we applauded, they kept the dance going for two hours, but it became rather monotonous towards the end.

Their boats were generally "dug outs," with large outriggers, and had frequently a high and pointed bow and stern. Each also carried a forked stick amidships, like a mast, on which they suspended things, probably to keep them dry; the paddles were short, oval in shape, and with a cross-piece at the handle.

Salt was obtained by evaporating sea-water by the heat of the sun in shallow trays made of palm leaves.

The chief diseases I saw were ulcers of legs, mild cases of ophthalmia, one compound fracture of the arm which had been badly set, or not set at all, and a large number of men and boys more or less covered with the scaly ringworm of these eastern islands (*Tinea circinata tropica*). Pustular eruptions in the children were also very common. Thus it will be seen from the above that their mode of life and customs are decidedly Papuan, especially as regards their weapons, ornaments, houses, gods, and carvings; but bearing in many respects a strong resemblance to those of the people of Tenimber, as described by Mr. H. O. Forbes, in "Naturalist's Wanderings in the Eastern Archipelago;"

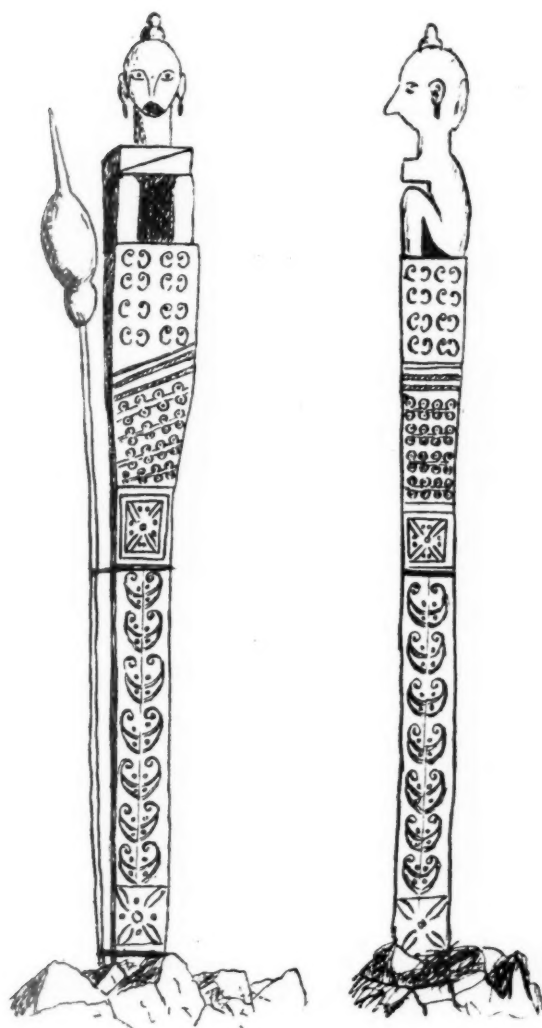
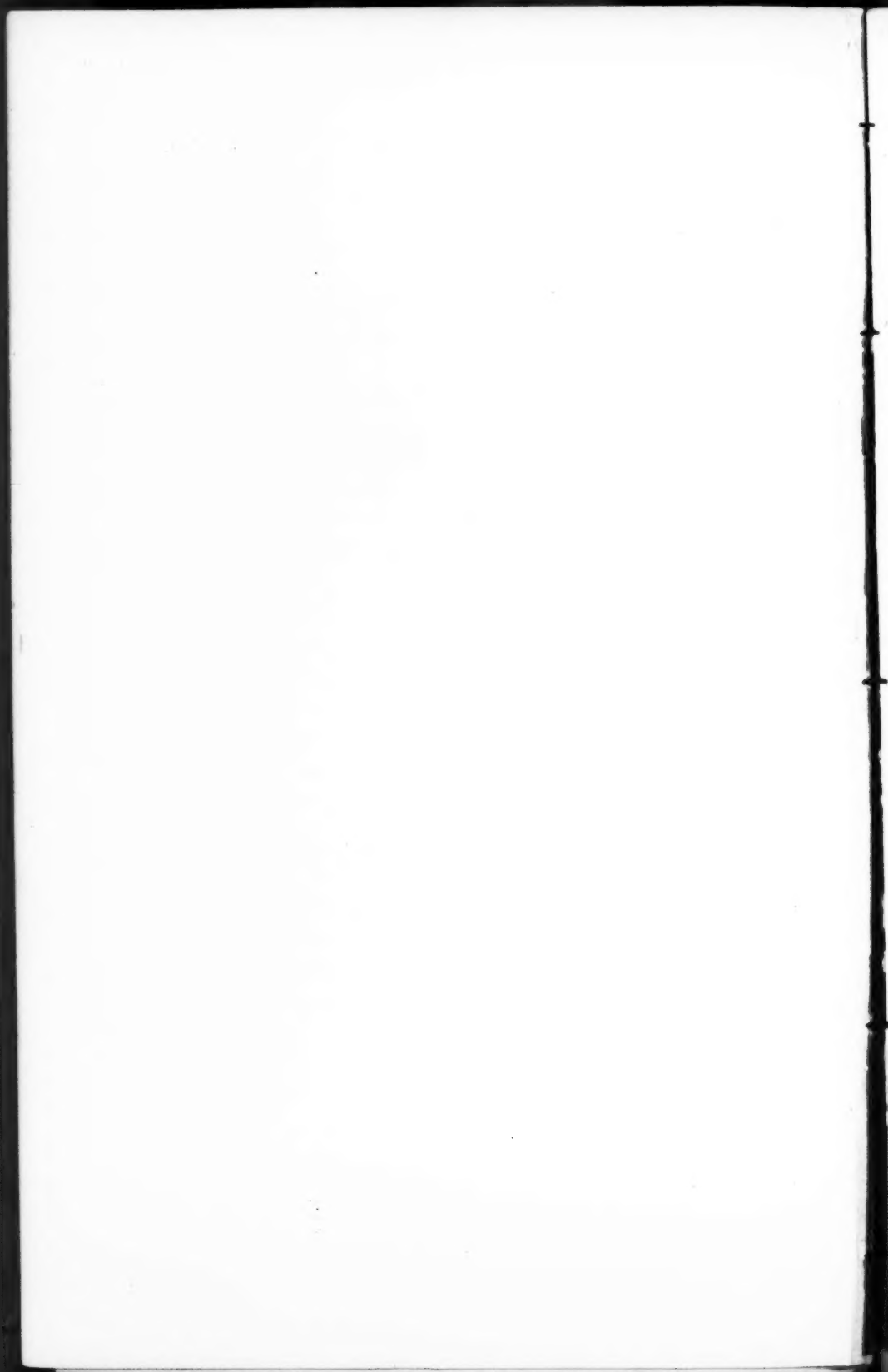
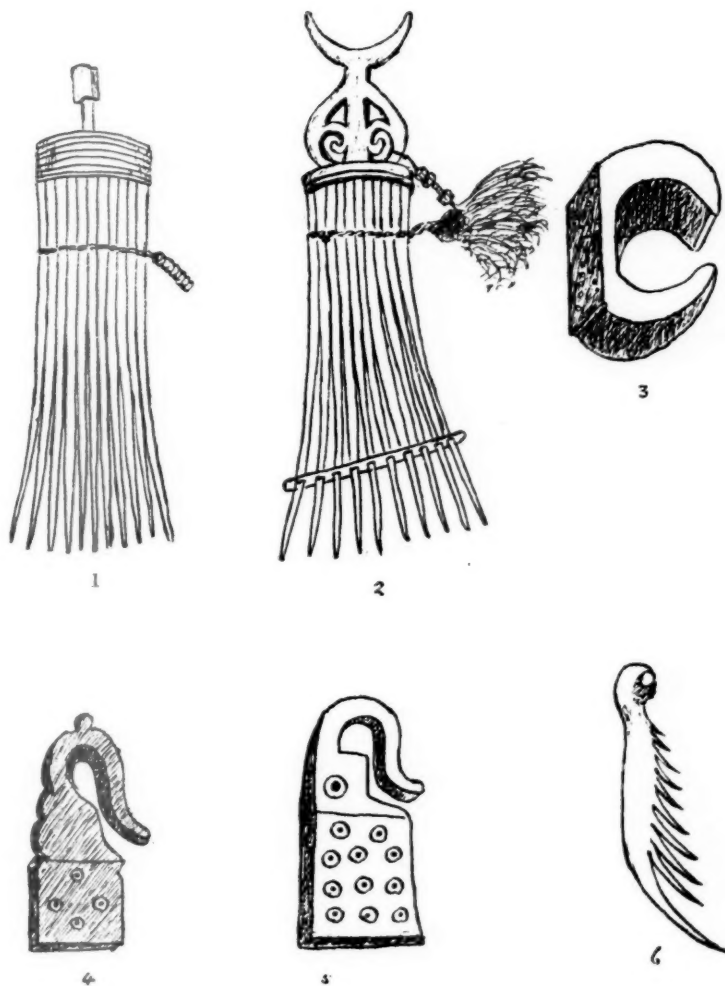


FIGURE OUTSIDE HILL VILLAGE.





1, 2.—BAMBOO COMBS.

3.—WOOD BRACELET.

4, 5, 6.—EAR PENDANTS.





thus physically and generally one may fairly consider that the majority belong to the "Melanesian," rather than the Malay, race.

The contrast to us of these pleasant-faced people, after the ugly natives of North West Australia, whom we had just left, and the Malays of Amboyna, shortly afterwards encountered, was striking.

The only quadruped obtained was a *cuscus*, but many large lizards were seen, and deer and pig are present. Eleven species of birds were collected, and many crustacea, etc. Mr. J. J. Walker, F.L.S., also obtained a valuable entomological collection.

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*On the TASMANIANS as Representatives of PALÆOLITHIC MAN.*

By EDWARD B. TYLOR, Esq., D.C.L., F.R.S.

[WITH PLATES X, XI.]

[Read March 21st, 1893.]

IN the accounts of early visits to Tasmania, we have little more than mentions of the chief uses to which the natives put their stone implements. Tasman, on the first discovery in 1642, without seeing any of the people, judged that the notches for climbing the great trees were cut with flints. In 1772, Marion du Fresne saw natives armed with pointed staves, and with stones which appeared to have cutting edges like axe-heads. Furneaux supposed the spears to be sharpened with a shell or stone, and later, Widowson states that they harden one end, which is very sharply pointed, by burning and filing it with a flint prepared for the purpose.<sup>1</sup> These remarks, however, do not show how the native stone implements of Tasmania differed from those of Australia and Polynesia. About 1860 a Tasmanian stone implement was brought to England by Mr. Thomas Dawson, who presented it to the Museum of the Somerset Archaeological Society at Taunton. As appears from the cast exhibited (see Plate X, Fig. 1, *a, b, c*), it is formed from a flaked-off fragment, dressed by chipping to a rough surface before being struck off the block, and then finished by a series of blows struck round the inner surface so as to remove a succession of small chips

<sup>1</sup> Swart, "Journaal van de Reis naar het onbekende Zuidland door Abel Jansz. Tasman," Amst., 1860, p. 71 ("met vuersteenen gehouwen"). Crozet, "Nouveau Voyage," Paris, 1783, p. 28 ("armés . . . de quelques pierres qui nous parurent tranchantes, semblables à des fers de haches.") Furneaux in Cook, "Second Voyage," vol. i, p. 113. Widowson, "Present State of Van Diemen's Land," London, 1829, p. 190.

from the outer, leaving a cutting edge. The sight of this instrument led me to make enquiry at the International Exhibition of 1862 in London, from Dr. Milligan, Commissioner for Tasmania, the best authority on the language and habits of the natives. From him I learnt that the Tasmanian women carried a quoit-like stone, 4 to 6 inches across, chipped about two-thirds round the edge, for notch-climbing trees; women would carry good ones. From these and other particulars obtained at the same time, I wrote as follows in 1865 in "Early History of Mankind," arguing that comparison of Drift implements with those found elsewhere breaks down any imaginary line of severance between the men of the Drift and the rest of the human species. "The Tasmanians sometimes used for cutting or notching wood a very rude instrument. Eye-witnesses describe how they would pick up a suitable flat stone, knock off chips from one side, partly or all round the edge, and use it without more ado; and there is a specimen corresponding exactly to this description in the Taunton Museum. An implement found in the Drift near Clermont would seem to be much like this."<sup>1</sup> These details are here given at length, as apparently the earliest mentions of a subject materially affecting the history of the Stone Age, namely, the persistence among these modern savages of a state of stone implement making comparable to that of mankind in their remotest acknowledged antiquity.

It appears from the records that Dr. Milligan after his return presented to the Royal Society of Tasmania specimens of native stone implements, now in their Museum at Hobart Town, and in 1873 a thorough examination of the manufacture and use of these rude tools and weapons by the aborigines was made by several capable observers in the Colony. When Mr. Brough Smyth, in preparing his great work on the aborigines of Victoria, was desirous of bringing the stone implements of Tasmania into comparison with those of Australia, a number of specimens were sent over to him, which he carefully described and figured. Questions arising, the whole subject was discussed at the Royal Society of Tasmania by Dr. Agnew, Mr. Ronald Gunn, Mr. Kane, Mr. James Scott, and others, with the best available information, the results of the conference being carefully set down.<sup>2</sup> Through this examination, the evidence of competent colonial eye-witnesses as to the native manner of making and using the implements was collected. Though information on the subject thus approached conclusiveness, the want of specimens in England

<sup>1</sup> Tylor, "Early History of Mankind," London, 1865, p. 195.

<sup>2</sup> "Papers and Proceedings of the Royal Society of Tasmania," 1873. R. Brough Smyth, "The Aborigines of Victoria," Melbourne and London, 1878, vol. ii, p. 401. H. Ling Roth, "Aborigines of Tasmania," p. 155.

made it difficult for anthropologists here to study fully the important problems raised by the stone implements of Tasmania. In 1890 I contributed a preface to Mr. Roth's work, bringing forward the Tasmanians as giving an idea of the conditions of the earliest prehistoric tribes of the Old World, at a somewhat less advanced stage of stone implement making than were the men of the Mammoth Period in Europe. Even then the Taunton specimen was the only one available.<sup>1</sup> At present, however, this difficulty is in great measure removed. At my request, it was brought under the notice of the Royal Society of Tasmania in 1890 by the Governor of the Colony, Sir R. G. C. Hamilton, and a number of selected specimens were sent over by the Curator of the Museum at Hobart, Mr. Alexander Morton. I have also, through the help of Mr. W. L. Williamson, of Brown's River, obtained a general collection of finished implements, wasters, and chips, much as they occur on the ground, in all about 150. These, with a small set of well-chosen examples in the hands of Mr. H. Balfour, Curator of the Pitt Rivers Museum, give fair means of judging the general characteristics. By examination of the specimens exhibited, in connection with the published information, I propose to state briefly the main points as to their material, make and use, with the view of using the position of the Tasmanians in the Stone Age as a standard for comparison with their position in general culture.

The present collection, which Professor A. H. Green, F.R.S., has been good enough to examine mineralogically, seems to include specimens of most or all of the materials described by Mr. R. M. Johnston in his *Geology of Tasmania*, and by Mr. R. Brough Smyth and Mr. Cosmo Newbery. The two kinds of rock principally used are characteristic. One is described by Prof. Green as an argillaceous rock, bedded but not finely laminated, for which the convenient term "mudstone" has been used; it has undergone some degree of induration, such as might be produced by contact with igneous rock. Mr. Johnston, who it should be noticed was also struck by the palæolithic character of the native implements, mentions that an altered mudstone from which they were made may be seen *in situ*, partly overlaid by greenstone, at Hunter's Mill, opposite Native Point, near Perth.<sup>2</sup>

<sup>1</sup> In 1873, Mr. Morton Allport sent over six Tasmanian stone implements with an instructive letter, published in the "*Journal of the Anthropological Institute*," vol. iii, p. 178, but unfortunately it is not known where these specimens are.

<sup>2</sup> R. M. Johnston, "*Systematic Account of the Geology of Tasmania*." Hobart, 1888, p. 334. Mr. Johnston remarks that the rudely chipped flints of the Tasmanians are of the simplest character, rarely symmetrical, and more like the earliest Palæolithic flint implements of Europe, especially those figured in the

In examining the present collection, it seems difficult to account for a comparatively soft mudstone being so much used for implements (Plate X, Figs. 3, 6; Plate XI, Figs. 8, 10) when far better material was available in the country. Especially the second kind of rock, of which a still larger number of specimens consist (Plate X, Figs. 2, 4, 5, Plate XI, Figs. 7, 11), is altogether superior in consistency and fracture, in fact comparing with good chert and flint in taking and retaining an edge. This is a pale grey close-grained stone in which fragments of quartz are visible to the naked eye; the microscope shows it to be a compressed and re-cemented grit, probably derived from the denudation of quartz felsite. Other materials, especially quartzite, are represented in the present collection, but specimens of them are few in comparison with those of mudstone and grit. The collection of implements now exhibited apparently agrees as to material with those studied at the Royal Society of Tasmania, where mention is made of two different kinds of stone, the one apparently an indurated clay rock, the other containing a large proportion of silex. It must be borne in mind that the word "flint" is used by writers in a loose popular way, meaning indeed no more than a sharp stone.

The conclusion recorded by the Royal Society of Tasmania as to the make of the implements is that no true tomahawks (*i.e.*, stone hatchets with handles) were known to or fabricated by the natives. They merely used sharp-edged stones as knives. These were made sharp, not by grinding or polishing, but by striking off flakes by another stone till the required edge was obtained. As a very general, if not invariable rule, one surface only was chipped in the process of sharpening. These statements are in general accordance with the observations of Mr. Brough Smyth and Mr. R. M. Johnston, and with the specimens now exhibited, but certain qualifications and explanations are needed, and further particulars have to be added.

Although some specimens are seen to be trimmed by rather fine chipping (as Plate X, Fig. 4, Plate XI, Fig. 9), there is no record of the small chips ever being flaked off by pressure, but only by blows with a stone. It is probable that this was the only method used, as when Mr. James Scott mentions seeing natives sitting for an hour at a time, chipping one flint with another, so as to give them the peculiar cutting

**Memoir of M. Ribeiro at the International Congress of Prehistoric Anthropology and Archæology, Brussels Meeting, 1872.** To judge from the not very distinct illustrations to this paper, the similarity is more or less real, but M. Ribeiro's specimens from Portugal are claimed as of Miocene and Pliocene origin, and in the present unsatisfactory state of the discussion on alleged Tertiary stone implements, I refrain here from any special comparison of the Tasmanian implements with them.

sharp edges. Sharp fragments merely struck off the block of stone are common; often these appear to be wasters, but such sharp-edged flakes (Plate XI, Fig. 11) being suitable for many purposes, were certainly used without further trimming. The edge-chipping of one surface only is clearly seen in the specimens (Plate X, Figs. 1, 5, Plate XI, Fig. 7) and Mr. Brough Smyth's remark is doubtless correct that this was done by holding the fragment in the palm of one hand with the edge outwards, and with a piece of stone in the other hand giving blows towards the palm and away from the edge. It should be added that the smooth inner surface detached from the core or block was turned upwards to receive the blows on its margin in this simplest and easiest process of edge chipping, as the specimens figured show. For bringing the implement into convenient shape, however, it is evident that chips might be removed not only from the outer surface, but sometimes from the inner. Certain wavy striations which appear in some of the figures (especially Plate XI, Figs. 7, 11) are natural, being due to the tearing of the stone. No implement of native manufacture shows any trace of having been ground or polished. There is nothing against the general agreement that this was never done, except Mr. Thirkell's letter describing the "sharp flint stone" used in notching trees for climbing, as having "the edge ground as sharp as they could against another stone." But the notching-stones (as in Plate X), being always edged by chipping, Dr. Agnew is probably right in suggesting that the writer only meant this.

There are statements of experienced observers that the implements were grasped in the hand for use, never mounted on handles. The information of Mr. Thomas Scott, Assistant Surveyor-General, who was in the Colony from 1820, is that he never learnt that the aborigines used the flint implements as tomahawks, but invariably held them in their hands with the thumb resting on the flat surface, and turning the stone as found convenient to get the cutting edges where required. Mr. Ronald Gunn, F.R.S., states that "those resembling tomahawks were held in the hand, and under no circumstances, so far as I know or can learn, were they ever fixed in any handle." The present specimens and all others known to me by description agree with these opinions. Care seems to have been taken so to shape them that they might rest conveniently in the hand for use. This is noticeable in the prevailing type of notching-stones and also in the stone knives with back and edge (Plate X, Fig. 4).

However, some other statements have to be taken into consideration. Dr. Agnew was told by some correspondents that in addition to the implements described, the natives made use



of others after the manner of axes, that is, they fastened to them handles in the shape of withes, bound round with the tendons of some animal. One of these letters is from Mr. James Rollings, who in his youth (1840 ?) had mixed with the natives and had many opportunities of seeing how they used their stone knives and tomahawks. After describing the ordinary implements grasped in the hand, he continues: "A larger stone, well selected, about four or five pounds in weight, was used for a tomahawk, a handle being fastened to it in the same way as a blacksmith fastens a rod to chisels, &c., for cutting or punching iron, being afterwards well secured by the sinews of some animal. The handles were strong saplings of wattle or curry-jong. These were the only stone implements he saw used among the natives, and very expert they were in using them." Dr. Agnew gives the general opinion of those who have examined the subject, when he says: "Other observers think our aborigines did not originally use these handles, but learned how to attach them from some New South Wales aborigines who came to this country in the early days of its settlement." To me this seems the most probable explanation. Such intercourse with Australian natives certainly took place, and may have introduced the Australian stone hatchet, but had anything like this been previously in the hands of the Tasmanians, we should expect to find specimens not merely of chipped stones, suited for hand grasping, but also of hatchet-blades made for fixing in a handle, and even polished after the native Australian manner. None such, however, have as yet appeared. It may be noticed that the statement as to stone hatchet-blades of the great weight of four or five pounds does not agree with the ordinary size of such implements either in Australia or Tasmania.

The question which suggests itself on first inspection of this collection of Tasmanian implements, is how with such poor tools even the rude native crafts could be carried on. It must be noticed, however, that they are for practical purposes somewhat better than they look, being indeed made with great care and skill in getting the edges straight and the grip firm. Fortunately also there are a few passages which show how they were actually used. It seems wonderful that with one of the disc-shaped notching-stones the natives should so quickly have made the notches for climbing the gum-trees, till we notice Mr. Thirkell's remark that they would "chip the bark downwards and make a notch for the big toe," which shows that they did not hack out a piece of the bark, but merely split it in the direction of the fibre, forcing the cut open with the toe till it could rest there. The following remark by Mr. Rollings shows how cutting was done.

"The knives when used for skinning kangaroos, &c., were held by the fore-finger and thumb, and the arm, being extended, was drawn rapidly toward the body. The carcase was afterwards cut up, and the knife was held in the same way. In cutting their hair, one stone was held under the hair, another stone being used above, and by this means the hair was cut, or rather, by repeated nickings, came off."<sup>1</sup>

From the foregoing evidence it appears that the Tasmanians, up to the time of the British colonization in the present century, habitually used stone implements shaped and edged by chipping, not ground or polished. These belong, notwithstanding their modern date, to the order of the very ancient "palæolithic" implements of the Drift and Cave Periods, from which the later implements of the "neolithic" order are distinguished by greater variety of form and skill of finish, and especially by the presence of grinding or polishing. The comparison of the Tasmanian stone implements with those of the ancient world impresses on us the fact that the rude modern savage was content to use a few forms of implement for all purposes of cutting, chopping, &c., these being flakes as struck off the stone, and such flakes or even chance fragments trimmed and brought to a cutting edge by striking off chips along the edge of one surface only, whether completely or partly round. Such tools are known to the Stone Age of the Old World. Mere chips of flint, &c., no doubt always served for much of the cutting and scraping which they were at least as well adapted to as more artificially made flakes would have been. The special though simple "scraper" edged by chipping from one surface, more or less closely corresponding both in shape and mode of making with the Tasmanian, belongs to the palæolithic period, where it is especially characteristic of the cave deposits of Le Moustier in Dordogne, while similar though usually neater examples continue to be found in the neolithic period. The Tasmanian, though using types of implement not unfamiliar to palæolithic man, is not known to have attained to making any implement approaching the characteristic palæolithic pick chipped into symmetrical form, and edged and pointed by chips taken in order from both surfaces. If it may be taken that the information from Tasmania is conclusive in this respect, it will appear that the savages there, within this century so miserably erased from the catalogue of the human race, were representatives of stone age development, a stage lower than that of the Quaternary period. Even should specimens of higher order be found in Tasmania, they will leave untouched the conclusion now established by abundant evidence, that during the present century the natives habitually made and

<sup>1</sup> Roth, pp. 17, 157.

used for the ordinary purposes of life stone implements of a low palæolithic kind.

The apparent ignorance of the Tasmanians of the art of fixing a stone implement in a handle, unless where natives of Australia had introduced among them their own mode of fitting, raises an interesting question as to hafting among the palæolithic men of Europe. Of the stone implements of the Drift and Caves, many are evidently made from stones chosen to fit the hand, or shaped with a view to grasping, while no certain evidence proves them to have been ever fixed in the wooden handles so certainly familiar in neolithic times. It is apt to be assumed that the Drift flint picks were stuck into clubs, bound in withes, or otherwise hafted, but this opinion seems generally due to an unwillingness to conceive even of most ancient savages as wanting the ingenuity to realize the advantage of an axe-handle. The force of this assumption is, however, lessened by the descriptions of the modern Tasmanians as not conscious of this want, but being content to grasp their rudely chipped cutting stones in their hands. It being indubitable that hand-grasped stone implements were used by these rude modern people for purposes for which, had they known of handles, they could easily and would certainly have had recourse to them, it results that we have no right to assume the wooden haft to have belonged to the earliest Stone Age, but are obliged to allow that it may have been invented at a later period of industrial development.

Of degeneration in culture as accounting for the low state of implement-making in Tasmania, there is at present no evidence, nor is it easy to imagine their rude tools as the successors of higher ancestral forms. Had they had even the hatchet of their Australian neighbours, sharpened by rubbing its edge on a grit-stone, and bound into a withe or cemented to a stick, it is hardly conceivable that they should have abandoned such a tool for a rudely-sharpened cutting stone gripped in the hand; they would have lost more time and pains in the first day than would have sufficed to replace the better implement. Such cavelessness would not indeed agree with the careful and patient skill which they, like other savages, gave to finishing their rude implements to the most serviceable point, in which they would spend hours and even days, regardless of trouble. The well-known readiness with which they took to European tools, shows an appreciation of labour-saving which contrasts strongly with the idea that at any time, possessing ground stone hatchets with handles, they abandoned them for chipped stones grasped in the hand. It seems more likely to consider that in their remote corner of the globe they may have gone on little changed from early ages, so as to have remained to our day living

representatives of the early Stone Age, left behind in industrial development even by the ancient tribes of the Somme and the Ouse.

Such being the position of the Tasmanians as modern tribes in the lowest Stone Age, the study of their culture in other respects affords valuable though imperfect guidance to formation of opinion as to the earliest distinctly recognizable period of human civilization.

This will appear more clearly from the following brief summary of native Tasmanian life,<sup>1</sup> which presents a picture of man at perhaps the lowest intellectual and industrial level found among tribes leading an independent existence, on their own land and after their own manner. It will be observed that their ideas and habits conform in a general way to the characteristics of normal or healthy savagery elsewhere in the world. Their arts, language, religion, social rules, are on the usual lines of the lowest tribes of man, only at simple and rude stages. The point especially to be noticed is that, just as their stone implements belong to the recognized stone age, though at an especially low level, so it is with the rest of their culture, which is not of an abnormal but only of a low and rude type. They have throughout the characters of mankind in a somewhat more primitive condition than any other tribe among those sufficiently known for detailed comparison, in either ancient or modern times.

Though living mainly by the chase, the Tasmanians knew nothing of the bow and arrow, nor of the spear-thrower characteristic of Australia. Their spear was a stick 16 or 18 feet long, scraped with their stone tools, and usually only pointed by the aid of fire, though there is once a mention of a point of human bone fixed on; though crooked and apparently clumsy, these were bent with the teeth so as to balance truly and were skilfully thrown. They had a wooden club or waddy with a roughened grip, for striking and hurling, and they seem to have used stones, apparently their ordinary choppers, in fight, and a flat wooden shield. They had not the Australian bark canoe, but a canoe-shaped solid float of bundles of bark on which they sat or stood, paddling or punting with a pole. They were string, net, and basket-makers; made fire with the simple fire-drill, and roasted their fish and game; put up such rude shelters of boughs as met the needs of their life of wandering in quest of food. Intellectually they showed no mean power when the inducement sufficed; in hunting and tracking their skill was a wonder to the white men, and in war the patient cunning of

<sup>1</sup> The authorities for this sketch may be conveniently consulted in Mr. Ling Roth's invaluable monograph on "The Tasmanians."

their pursuit and ambush made them, in spite of their miserable weapons, a terror. They drew pictures on bark, &c., which seem from descriptions to have shown ordinary savage skill; one copied by Bonwick might have been done by native Americans. In no respect is superiority of the European cave-men to them more striking than in their drawing and carving, which the Tasmanians had no pretension to rival.

The following remarks fairly sum up their mental position: "Their intellectual character is low; yet not so inferior as often described. They appeared stupid, when addressed on subjects which had no relation to their mode of life; but they were quick and cunning within their own sphere." Morally, the descriptions of their character present the usual contrasts of savage life; the mother would rush through the fire to save her child, the son would abandon his sick or aged parent under a ledge of rock or in a hollow tree. On the one hand we read of their peaceful and inoffensive kindness, on the other hand of their treachery and relentless cruelty. One colonist never finds it necessary to carry fire-arms to protect himself, while another after carrying his gun for days, lays it down for a moment, and instantly from behind a tree the spear of an unseen black reaches him, one of a party who break out of their hiding places to set fire to the house and kill the women and children. But this contrast of behaviour, under different conditions, only illustrates in an extreme form the law which guides ourselves in our different conduct toward friend and enemy. Perhaps no people ever had more rudimentary rules of law and government than these savages, with no property in land, but waging war to the death against the trespasser in pursuit of game; with hardly any government over the wandering clan except the undefined authority of "the bully of the tribe," and yet as soon as war broke out following with absolute obedience the chosen war chief.

Taken as a whole, this may be the rudest picture known of the condition of a savage people leading a healthy normal life, getting their living from nature. It has no small importance in the light it throws on the problem of civilization. A people isolated from interference from without, and in harmony within with their "*milieu environnant*," to use the term of Lamarck, so that circumstances to no great extent compel improvement or bring on decay, may, it seems, remain comparatively unchanged in their level of culture, even from remote prehistoric ages, just as mollusca of species first appearing far back in the earlier formations may continue to live and thrive in modern seas.

Of the Tasmanian language, the details which have come down, incomplete as they are, are sufficient to show an agglu-



tinating language of simple structure, but not extraordinary lowness. The root-forms can be to a certain extent separated from suffixes, such as *na* (singular), as *pugga-na*=man, *lowa-na*=woman; the suffix disappears in combination, as in *lowa-timy*=bachelor (woman-without). Reduplication forms plurals, intensives, &c.; as *nubra-na*=eye, *nubru-nubere*=eyes. Compound words suffer contraction, thus *panubere*=sun, appears beside the fuller form *pallanubrana*, which seems made up of *palla-nubra-na*, that is, (black)man's eye. Imitative words, though not unknown, seem by no means common. On the whole, the Tasmanian is quite remote from anything like an origin of language.

The records of the religious ideas of the Tasmanians are full of interest from the present point of view. It is true that some misleading details have been given, through want of ability to distinguish native from imported beliefs, but these can be eliminated and genuine information confirmed by means of the native vocabularies. Thoroughly native beliefs, moreover, differ from anything that could have come from Europeans. Thus it was certainly not from the religion of the foreigners that the natives learnt their fundamental doctrine of the *warrawah* or shadow as being the human ghost, nor the action of such ghosts in curing diseases by expelling the demons causing them, nor the custom of wearing bones of dead friends to secure the protection of their spirits, who were the manes-deities to whom they looked for guidance and help in trouble. The native belief in a future state involved life in some distant region, and especially the foreigners were as elsewhere identified with dead Tasmanians returned from the spirit-land. If the spirits swarming in mountain and forest resembled the European elves and fairies, their genuineness in native belief is plainly proved by native names, as *nanginya*, an elf or hill fairy, and their name for the echo, *kukanna wurrawina*, that is, talking shadow. Their spiritual hierarchy included greater demons or deities, whom according to Milligan, the best judge in such a matter, they do not seem to have considered benevolent. For such beings there were native names, especially that written down as *rediarapa*, *rargeropper*, *raegoo wrapper*, who was said to cause thunder and lightning, and whose name the colonists adopted as a term for their own Devil. At this point, however, Christian ideas become mixed with native Tasmanian, and beliefs are asserted as to a good and evil spirit which have no confirmation in the vocabularies or in testimony of competent observers, and must be rejected as borrowed theology. But as a whole, the Tasmanian religion was a rude animism, based on the same fundamental principles as the religions of the lower races



elsewhere in the world, and even carried out in great measure in similar developments.

In conclusion, the effect of the present evidence may be stated as confirming and extending the argument, familiar on neolithic ground, that the condition of modern savages illustrates the condition of ancient stone age peoples, representatives of a stage of culture at once early in date and low in degree. The Tasmanian specimens and records now place us in full view of the state of a people in the palæolithic stage, who may have lasted on in their remote and unvisited home from the distant ages when rudely chipped stones grasped in the hand were still the best implements of mankind, to be only in future ages superseded by higher types with their sharp-ground edges and effective helvies. The life of these savages proves to be of undeveloped type alike in arts and institutions, so much so that the distinction of being the lowest of normal tribes may be claimed for them. Still, though the difference between them and even their Australian neighbours is enough to mark lowness of stage, it by no means amounts to an immeasurable interval. Their palæolithic state does accompany a corresponding lowness of general condition, as compared with that of modern neolithic savages. But the passage from neolithic to palæolithic only carries us back a stage. The great initial developments of language, arts, religion, society, still remain in the remote background of human development.

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MAY 9TH, 1893.

Professor A. MACALISTER, M.D., F.R.S., *President, in the Chair* ;  
afterwards JOHN BEDDOE, Esq., M.D., F.R.S., *Vice-President*.

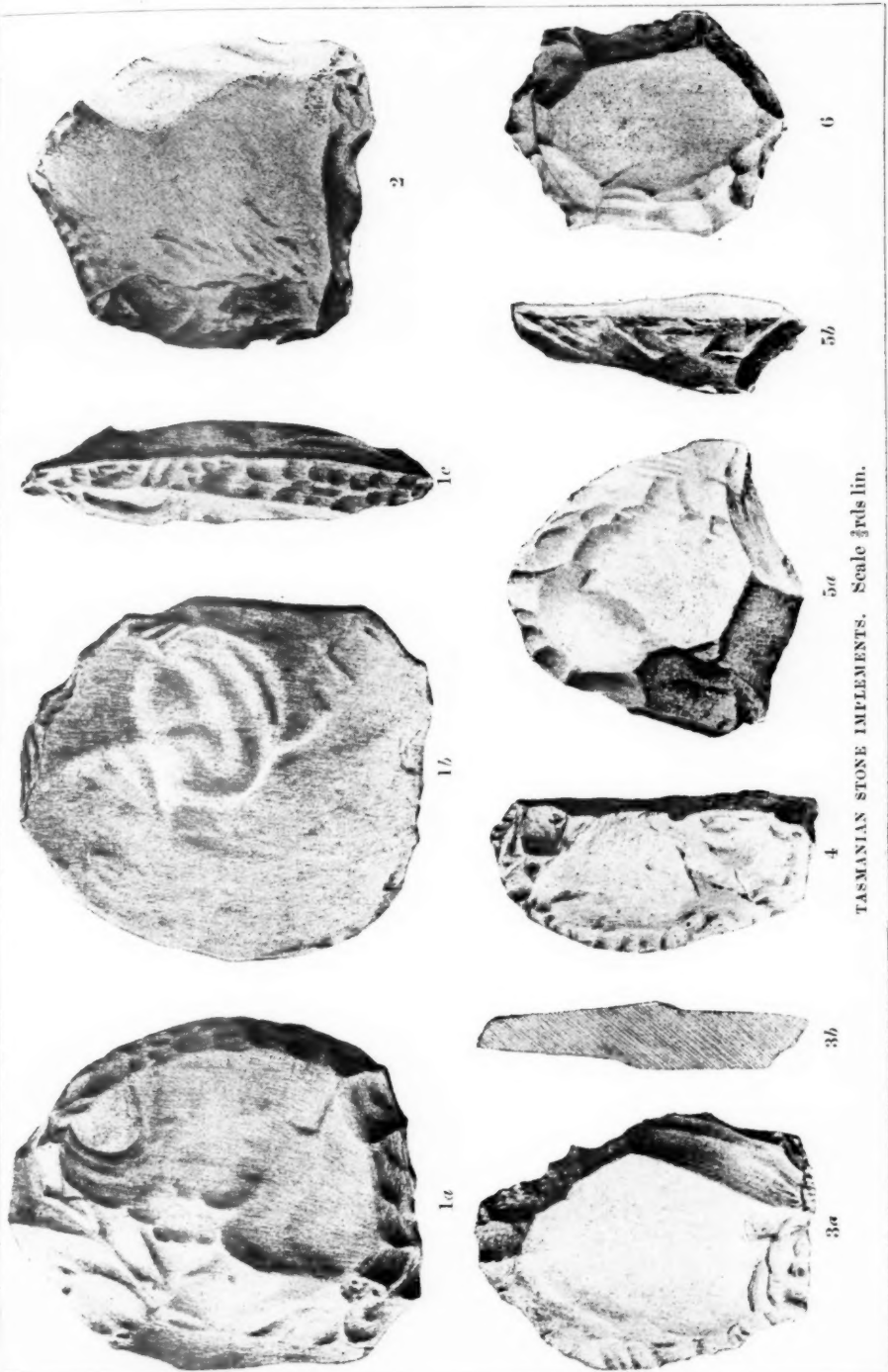
The Minutes of the last Meeting were read and signed.

The election of CHARLES GEORGE HALE, Esq., of Ivy Hatch, Sevenoaks, was announced.

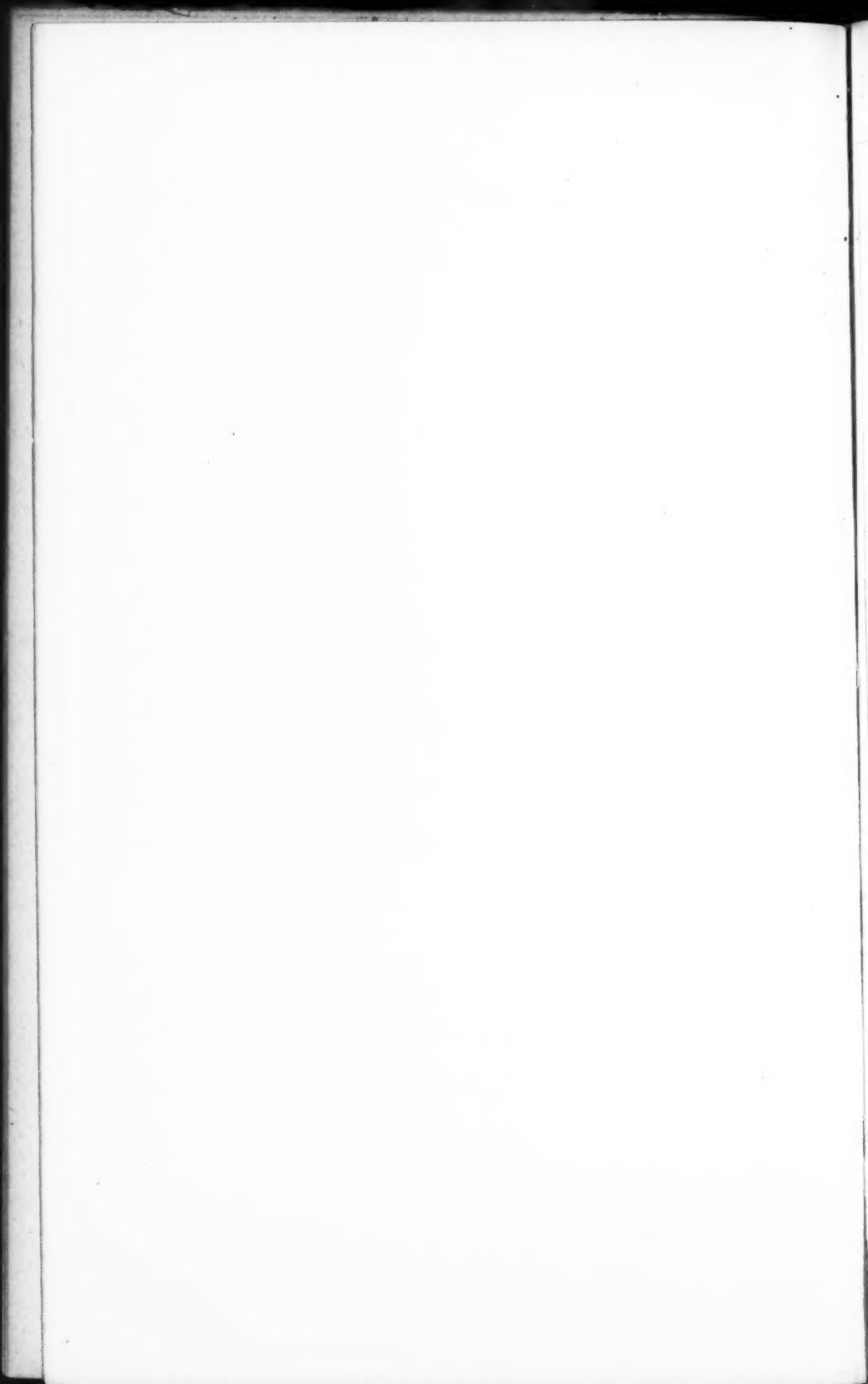
The presents that had been received were announced, and thanks voted to the respective donors.

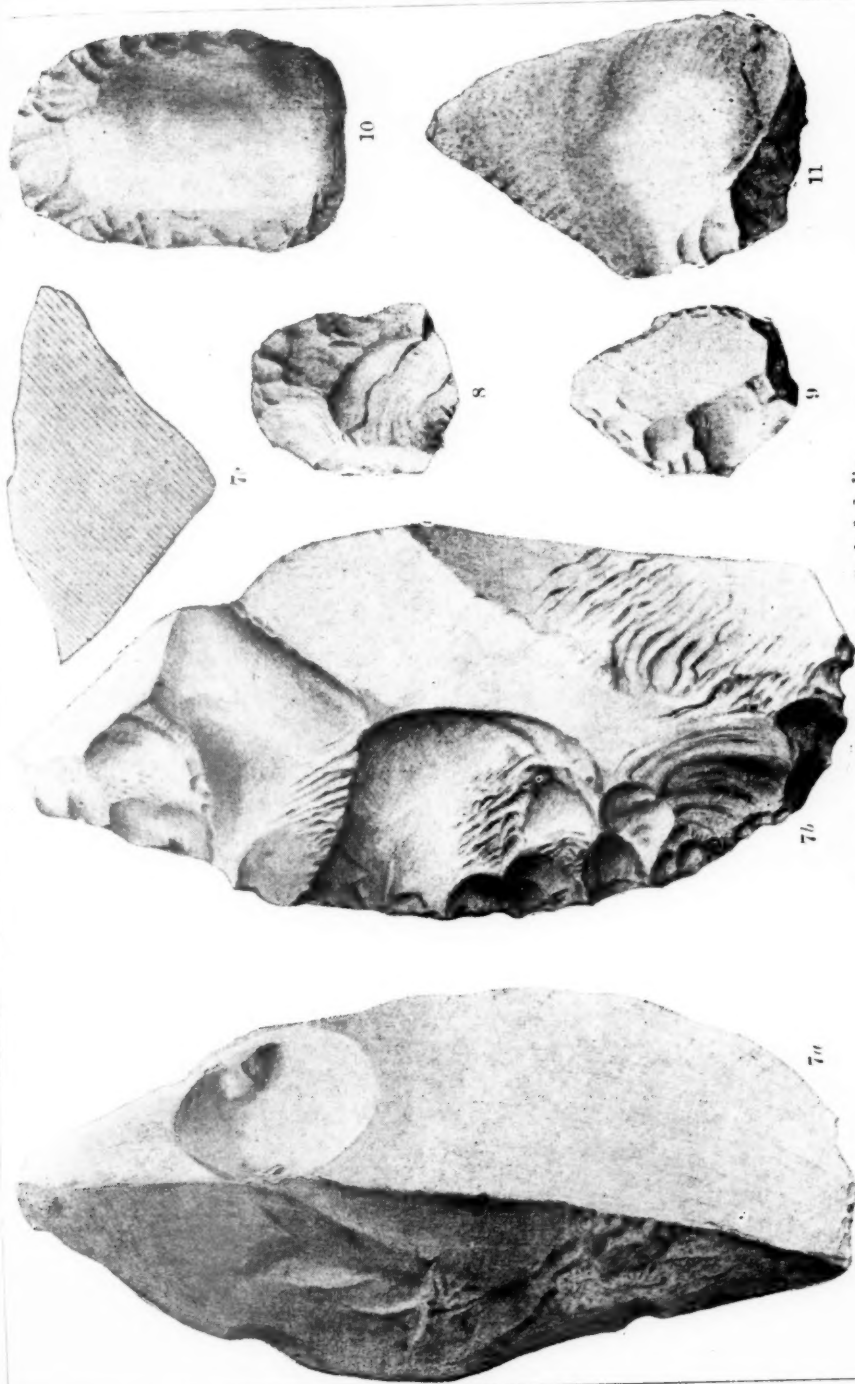
Mr. C. DUDLEY COOPER exhibited the skull of an aboriginal Australian, upon which Dr. GARSON made some remarks.

A paper on Borneo, by Mr. C. HOSE, was read, and the author exhibited a large collection of objects of ethnological interest from that country.

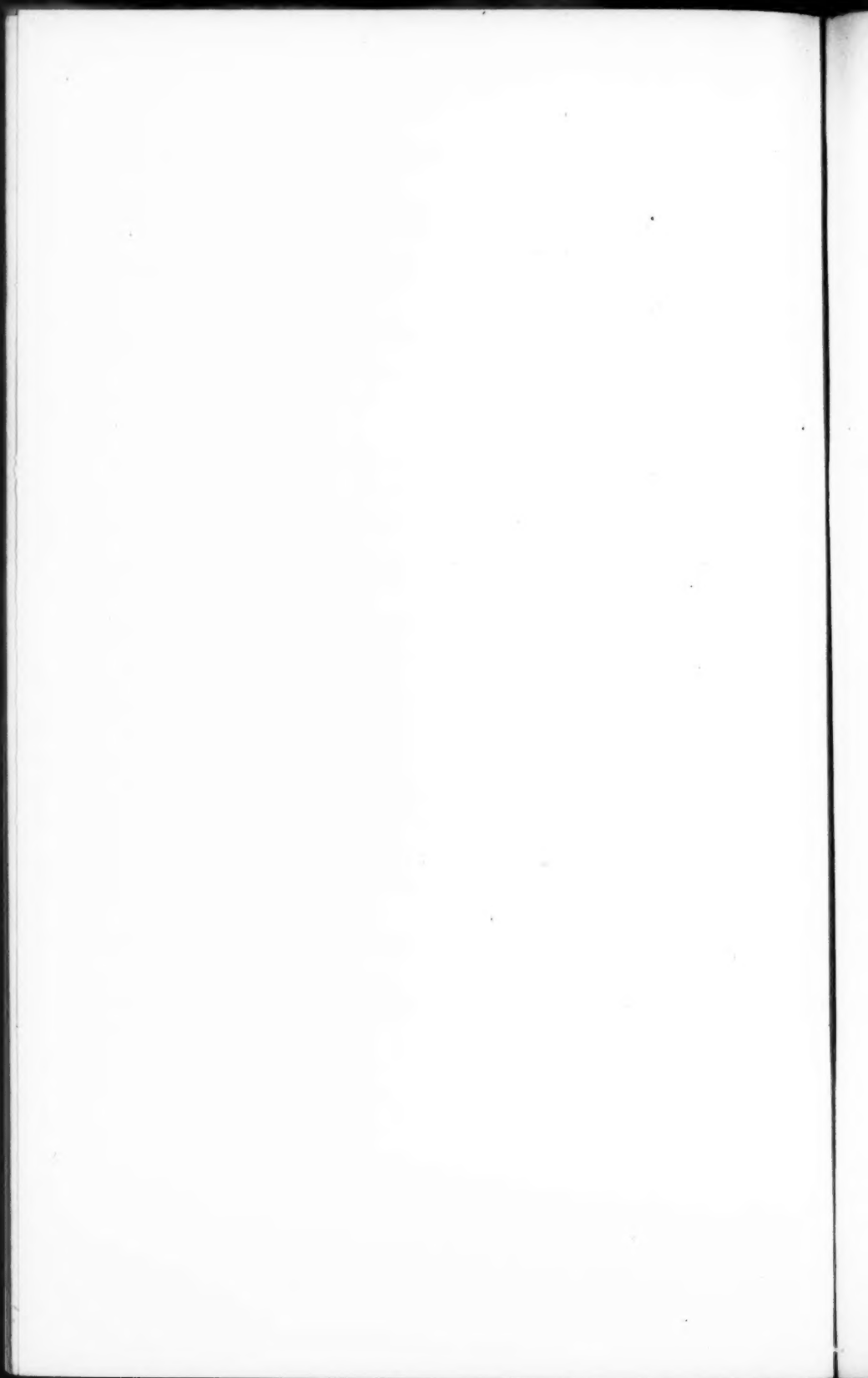


TASMANIAN STONE IMPLEMENTS. Scale  $\frac{3}{4}$  in.





TASMANIAN STONE IMPLEMENTS. Scale  $\frac{1}{3}$ rd lin.



Dr. BEDDOE, Sir HUGH LOW, Mr. RANDALL H. PYE, Mr. H. O. FORBES, Professor HADDON, Mr. C. H. READ, and Professor THANE took part in the discussion.

Professor MACALISTER exhibited a skull from North Borneo.

Mr. RUDLER exhibited a wooden fire syringe from the Malay Peninsula with a brass tinder box.

A paper by Mr. R. G. LEEFE on the "Natives of Tonga" was taken as read.

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NOTES on the SKULL of an ABORIGINAL AUSTRALIAN.

By C. DUDLEY COOPER, M.R.C.S., *Assistant Medical Officer,  
Claybury Asylum.*

(Introduced by Professor G. D. THANE.)

[WITH PLATE XII.]

THE skull shown was found as part of a complete skeleton at Williams Town, Victoria.

The first point of interest is the *cranial capacity*. In the estimation of this—shot, Garson's rammer, and a funnel of 12 mm. in diameter were used—six observations were made, three by Professor Thane and three by myself independently, and an average of 1,500 cc. resulted. That this is exceptional is shown by the fact that it is greater than any recorded by Sir William Flower<sup>1</sup> by 40 cc. The average cranial capacity given by Flower is 1298 cc. for thirty-two skulls examined. MM. de Quatrefages and Hamy<sup>2</sup> give an average of 1269 cc., and Sir William Turner<sup>3</sup> a still lower one of 1230 cc., based on an examination of thirty-four skulls. Turner, however, has recorded the skull of a male from Port Curtis, Queensland, whose cranial capacity was 1514 cc., and this is the only instance I can find of an aboriginal Australian skull having a larger cranial capacity than the one I am now showing.

The *external measurements* of the skull, taken with Flower's craniometer, are as follows:—

From the glabella to the occipital point ..	193 mm.
From the ophryon to the occipital point ..	192 mm.
Maximum breadth (interparietal) .. ..	142 mm.
Basio-bregmatic height .. .. .	137 mm.

<sup>1</sup> Osteological Catalogue—Royal College of Surgeons. Part I, "Man," 1879.

<sup>2</sup> "Crania Ethnica," 1873–81.

<sup>3</sup> "Voyage of H.M.S. 'Challenger.'" Report on the Human Crania, vol. x.



These measurements give a *cephalic index* of 73·6 or 74, according to the length-measurement used (GlO or OphO): either of them is slightly above the average given by Flower.

The *index of height* is 71—Flower's average exactly.

The horizontal circumference of the skull, taken with a tape-measure over the ophryon and the occipital point is 533 mm.

On noticing the transverse arch of the cranium it is seen that the line of the sagittal suture is elevated, and the surface of the parietal bones somewhat flattened, so that if the skull be viewed from behind the pentagonal figure, which has been so often described in these Australian skulls, is rendered very distinct.

The degree of complication of the sutures corresponds to No. 3 of Broca's<sup>1</sup> scale, but a few of the dentations are somewhat longer than those of the scale.

The glabella corresponds to No. 4, and the inion to No. 1 of Broca's scale.

*The Face.*—The most striking characteristic of the face is the marked prominence of the jaws. If the basi-alveolar length of 110 mm. be compared with the basi-nasal length of 106 mm., an *alveolar or gnathic index* of 103·8 is obtained. (Prognathous.) This index is slightly above the average for Australians. Flower's average being 103·6 for fifty-one specimens examined, and the mean gnathic index in Turner's specimens was 100·3, making the average meso-gnathic. Two of his specimens, however, had the high gnathic indices of 108.

The mandibular angle is 120°.

The symphysial angle is 100°.

The measurements of the nose give a *nasal index* of 55·8. (Platyrrhine.)

These measurements are:—

Nasal height..	..	..	..	..	52 mm.
Nasal breadth	..	..	..	..	29 mm.
Nasion to nasal point	..	..	..	..	52 mm.
Nasal point to alveolar point	..	..	..	..	20 mm.

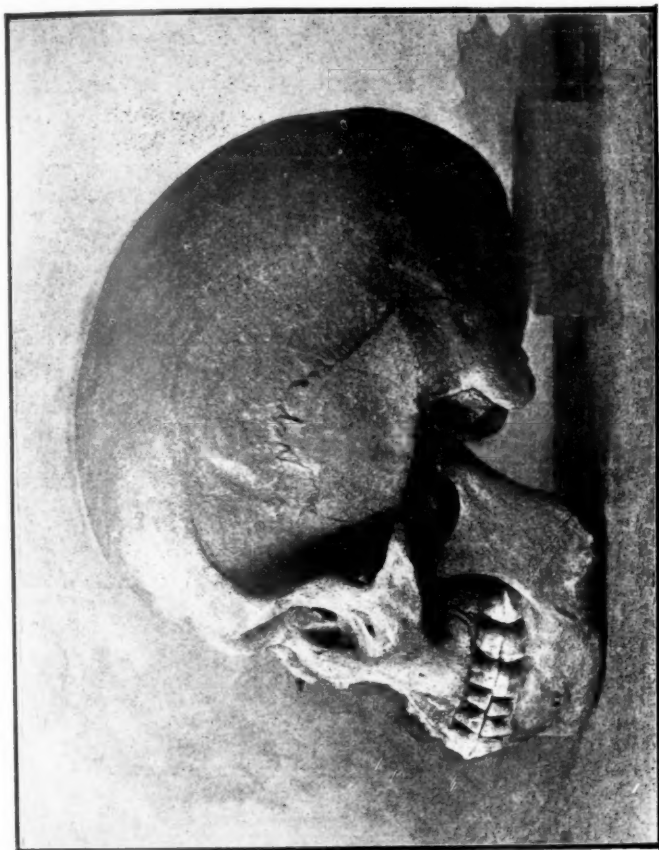
The orbital height (the right orbit being used for measurement) is 35 mm., and the breadth 40, giving the somewhat high *orbital index* of 87·5. This index would place the skull in the mesoseme group, whereas the majority of aboriginal Australians are microsemes.

Other facial measurements are:—

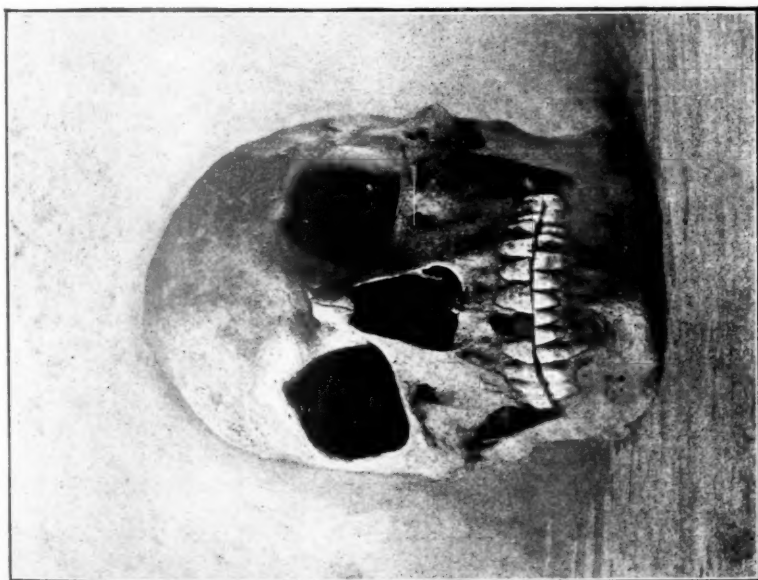
Naso-malar line	..	..	..	..	118 mm.
Bi-malar line	..	..	..	..	109 mm.,

so that the *naso-malar index* of Oldfield Thomas is 108·2.

<sup>1</sup> "Instructions Craniologiques et craniométriques," Paris, 1875.

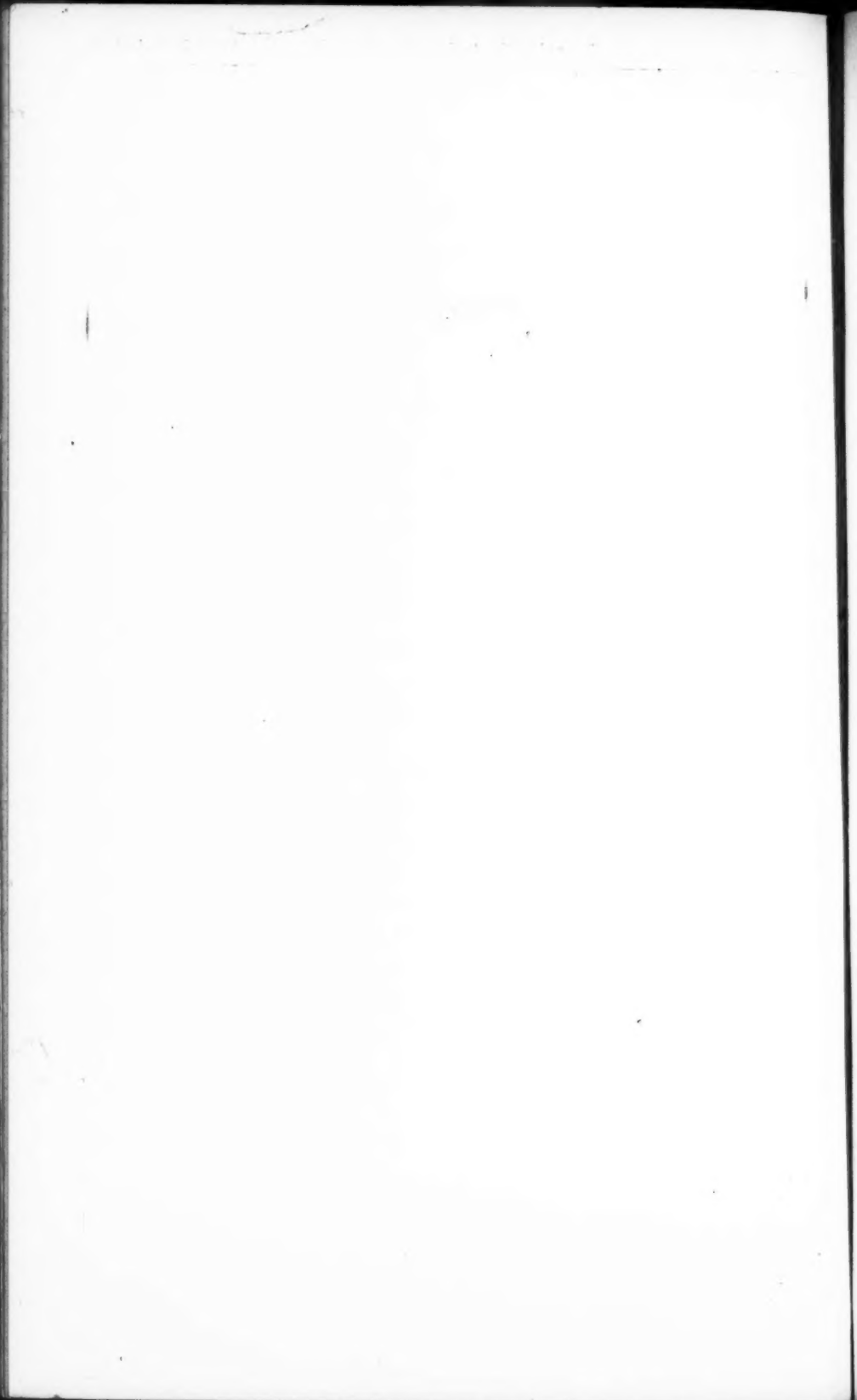


*b*



*a*

SKULL OF AN ABORIGINAL AUSTRALIAN.



*The Palate.*—Measurements:—

Palato-maxillary breadth .. ..	71 mm.
Palato-maxillary length .. ..	66 mm.,

giving a *palato-maxillary index* of 107.5.

*The Teeth.*—I have elsewhere<sup>1</sup> given a short description of the teeth of this skull, but I append one here for the sake of completeness. The teeth are in a very good state of preservation and are all present, with the exception of the right upper central incisor. This tooth was present during life, but was lost after the arrival of the skull in this country. The crowns of the teeth are very much ground down, more especially those of the molar and premolar series. Their degree of usure corresponds to No. 3 of Broca's scale. If the two jaws be articulated, it is seen that, in accordance with the observation of Sir Wm. Turner<sup>2</sup> on these skulls, the two sets of incisors are in contact by their free cutting edges.

That the crowns of the corresponding teeth of the upper and lower jaws in the majority of Australian skulls are not in the same vertical plane is well borne out by the specimen shown. In this skull the crown of the lower wisdom tooth projects somewhat behind the upper wisdom. The second molars are in almost a vertical plane, but the remaining teeth of the molar and premolar series of the lower jaw are situated slightly in front of the corresponding upper teeth.

The width of the upper dentary arcade, between the first molar teeth, is 67 mm.—the maximum of Sir Wm. Turner's measurements being 66 mm. The width taken between the second molars is 72 mm., being slightly below the 73 mm. maximum of Turner. Between the wisdom teeth the width of the arcade is 70 mm., Turner's maximum in the same situation being 75 mm.

The width of the lower dentary arcade, taken between the first molar teeth, is 61 mm.—Turner's maximum being 63 mm.—opposite the second molars the width is 66 mm. as compared with 69 mm. of Turner's, and between the two lower wisdoms the width is 70 mm., Turner's maximum for eleven skulls measured exceeding it by 2 mm.

The measurements show that the upper jaw exceeds the lower in width between the first molars by 6 mm., Turner's average excess in the same situation being 5 mm. Between the second molars the excess of the upper over the lower jaw is also 6 mm., higher than Turner's average measurement by 2 mm.

The antero-posterior measurement of the crowns of the molar

<sup>1</sup> "Proceedings of the Anatomical Society of Great Britain," May, 1892.

<sup>2</sup> "Journal of Anatomy and Physiology," July, 1891.

and premolar teeth is, in the upper jaw on the right side 51 mm., on the left, 49, giving an average of 50, very near Turner's maximum of 51 mm. In the lower jaw the measurements are on the right side, 53 mm., and on the left, 53 mm., Turner's maximum being 56 mm.

The excess of the lower antero-posterior measurement over the upper was 3 mm., exactly the same as Turner's average excess both for aboriginal Australians and Europeans.

The antero-posterior measurement of the true molar series gives, in the upper jaw on the right side, 34 mm., on the left, 33 mm., being an average of 33·5, somewhat below Turner's maximum of 36 mm.

In the lower jaw on the right side the antero-posterior measurement is 38 mm., and on the left side 38 mm., as compared with the 40 mm. maximum of Sir Wm. Turner. The excess of the lower over the upper jaw in the antero-posterior diameter of the crowns of the true molar teeth is 4·5 mm.—Turner's average excess being 2·8 mm., and his maximum 5 mm.

The *dental index* of Flower is 47·1°.

I have to thank Professor Thane for much kind help in taking the measurements.

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### *The NATIVES of BORNEO.*

By C. HOSE.

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#### *Mode of Life.*

THE races of the Baram District (approximate Lat. 4° 30' N., Long. 113° 52' E.), situated in the northern portion of Sarawak territory, may be divided into four large sections, as follows:—

- (1) The low country people and the inhabitants of the coast.
- (2) The Kayans and Kenniahs, inhabiting the head waters of the Baram River and its tributaries.
- (3) The Kalabits—a numerous race of people living inland on the hills and plains, to the north of the Baram River, and in the far interior of that part of Borneo.
- (4) The Punans—nomadic tribes, found at the head waters of all the big rivers in central Borneo.

Each of these four divisions comprise a number of sub-divisions speaking different dialects which can, however, be traced to the same origin.

The sub-divisions are as follows:—

(1) Amongst the low country people we find the different dialects of the Malanans, Maroms, Dallis, Kadayans (who must not be confounded with the Brunei Kadayans), Orang Bukits, Long Kiputs, Batu Blahs, Miris, Barawans, and Long Patas. The burial customs of these people present a similarity, excepting where a few extraneous ideas have been introduced by a stronger race, such as the Kayans.

(2) The Kayans and Kenniahs are sub-divided into the Uma Pliaus and Uma Poh Kayans, Long Wats, Uma Pawas, Sibops, Leppu Laangs Madangs, and Leppu Pohun Kenniahs. The first three of the above-named sub-sections are of the Kayan race. The rest are to be regarded as Kenniahs.

(3) The Kalabits are a race of people bearing a very close resemblance to those enumerated under No. 1, possessing many traits and habits in common with the Barawans and Long Patas, formerly inhabiting the country now occupied by the Kayans. They were separated from the low country people and driven out by the Kayans who came from the Balungan and Koti rivers some eight generations back.

The Kenniahs who migrated to the Baram River some hundred years or so before the Kayans, were the only people able to resist the constant raids made by the latter, who, being a blustering, warlike race, almost exterminated the smaller tribes and made slaves of the weaker ones. Naturally the Kayans occupied the best tracts of land consisting of the undulating areas between the swampy low country and the mountains at the head waters; they also confiscated all the caves of the esculent swallows, selling their nests to the traders whenever a Brunei, Malay, or Chinese dared to venture up river amongst them. Kayans often travelled as far as Brunei in their long boats, and some few even adventured as far as Singapore, taking passage in Chinese junks to Labuan to sell the produce of these caves.

(4) Punans. I have no doubt in my mind that this wandering race of people are the aboriginals of the country. In physique they are a fine healthy race, large boned and very strong, with fair skins and a complete immunity from skin diseases. They build no houses, and live upon what they can shoot with the blowpipe and on jungle fruits, and owing to their custom of always living in the shade of the dense forest, are afraid of the sun. They are an honest and unselfish people and they alone of all the races in Borneo do not regard the human head as a trophy of war and the taking thereof as a legitimate act of prowess; and when once well known they undoubtedly prove to be the best mannered people of any of the savage tribes



inhabiting the island. They have large families of from seven to ten children, which is also unusual in Borneo, and though no doubt the weaker members die young owing to the rough life they lead, this fact tends to preserve and improve the physical excellence of the race. They are great hunters, being able to move through the jungle without making the slightest noise, and have a name for every living thing, which name is known by even the small boys. They are wonderfully expert in the use of the blowpipe, shooting their poisoned arrows with such precision that it may be said that they seldom miss even the smallest object aimed at, yet this efficiency with their weapons notwithstanding, they are a very timid race, but can fight in self-defence.

The Punans never plant paddy, but sometimes collect the fruit of a tree called "Pran," which they dry and store for a time. They work india-rubber, and are really the only people in Borneo who systematically work the camphor tree, exchanging the camphor with the Kayans and Kenniahs for tools, tobacco, &c.; the Kayans, not wishing them to know the true value of their products, cut them off from all direct communication with the Chinese and Malay traders.

Polyandry is occasionally practised amongst the Punans, but the instances are very rare, and then it is generally found that a difference of some thirty or forty years exists between the ages of the two husbands, the age of the younger usually corresponding with that of the wife.

They occasionally live in caves, but not for long periods, as the caves, being mostly of limestone formation, are damp and cold, and are consequently liable to breed fevers. When suffering from fever they swallow the poison which they use for their arrows, and which is regarded by them as a valuable medicine when taken internally. Punans who have not mixed amongst the Kayans use no boats, but they are capable of covering great distances in a day on foot, the women of the party carrying almost as much as the men.

All the other races use boats, excepting those who live far inland and away from the large rivers, as for instance, a few of the Kalabit tribes. The Kayans and Kenniahs use both long and short boats—a long boat, cut out of the trunk of one of the large forest trees (the native name of which is *Aroh*), sometimes measuring thirty-eight yards in length, and seven feet in beam; a boat of this description will accommodate a hundred men who sit two abreast plying their paddles on either side of the boat simultaneously, and thus propelled it attains a rate of speed enabling it to travel (at a rough calculation) between fifty and sixty miles in a day. The common name given to this boat is

*Harok*; a smaller boat propelled by about twenty paddles is known as a *Temoi*, and they also make use of various little dugouts of all sizes, for travelling between their houses and rice plantations.

The boats used by the coastal people are most suitable for entering the mouths of rivers, and are called *Barongs* and *Tukaus*; they are good surf boats and will stand a bad sea if properly handled. The Malanaus (coast tribe) are very skilful in taking one of these boats into the mouth of a river when there is a heavy sea running, the *modus operandi* being as follows:—They bring the boat up to a big wave rolling in, and ride on the top of the wave a distance of two hundred yards, paddling hard all the time to keep pace with its momentum and in order to get into smooth water before the succeeding big wave reaches and breaks over them, and when skilfully done, this manœuvre forms a very pretty sight. These people also use various kinds of small boats.

All the various races excepting the Punans, employ dogs in hunting; in speaking of Punans in this way it must be understood that I refer only to those who have not mixed with other races, as those Punans who have come in contact with the Kayans, have adopted many Kayan habits and customs.

The hunters are armed with a long spear and a sort of chopper (*parang*) and hunt on foot usually in parties of from three to ten. They kill numbers of wild pigs and deer, and I believe that every race in Borneo except such as are Mahomedan, will eat wild pig, but the Kayans will not eat deer or wild cattle. Kenniahs again will not eat the large lizards, but Kayans will kill the deer when they get an opportunity and the Kenniahs will kill the lizards. So also the Kayans will not kill the Borneo tiger-cat (*Felis nebulosa*) or even touch the animal, but they will buy its canine teeth for large sums from the Kenniahs and use them to put through their ears, and though the Kenniahs may kill it, I doubt if they dare to treat its flesh as an article of diet. Only a Kenniah chief is allowed to wear the skin of a real tiger as a war coat, and then only if he has had a propitious dream during sleep with the tiger skin hanging over his head. Before lying down to sleep the chief explains to the skin the use he wishes to make of it and begs the spirit to tell him the truth in his dreams as to his future fate. The call of certain birds is to them an omen when they are out on a hunting expedition, and they are influenced by these birds in almost all their daily actions.

They devise various kinds of traps, usually of the nature of a spring trap made with a bent sapling, and some of them are very ingenious.

Fishing is done in various kinds of ways but perhaps the most efficient, though not the most sportsman-like method, is that of poisoning the water for a time by means of the juice of a root called the *Tuba* root.

This root is beaten into a pulp in the bottoms of small boats which are upset on a given signal, and as the white milky juice floats down the river it has the effect of intoxicating the fish and sending them to the surface when they are easily speared by people in small boats which cover the river by hundreds. Sometimes as much as a couple of tons of fish are taken in a few hours by this method which in no way renders the fish unfit for eating purposes; it is always a great event and hundreds of boats crowded with the fairer sex turn out to see the fun—the sight reminding one somewhat of the Cam in the May week.

The casting net is also used, and on the coast the seine net, but fish are so abundant that few people are content to use a rod and line, though occasionally one sees a man fishing in this way; fish are also caught in traps of various kinds in large numbers. The fish spear (*sarampang*) is so arranged that when a fish is struck the head of the weapon comes out of the socket, but the head being tied to the bamboo shaft, it is impossible for a fish to remain long under water as the bamboo is always bearing it to the surface, when another spear is plunged into the fish and it is secured.

The usual way of cooking rice is in a small brass or iron pot, called a *Priok*, while vegetables and small pieces of meat are boiled in an iron pan (*qualli*); fish forms one of the staple articles of diet.

At meals, they usually drink only after they have finished eating, as they contend that by abstaining from taking liquid with their food they prevent indigestion; the men usually feed alone, attended on by the women, and always wash their mouths out when they have finished eating. They are very particular about being called away from their meals, and it takes a great deal to make a man set about doing anything before he has concluded his repast; to such an extent is this practice observed, that it is considered wrong to attack even an enemy whilst he is eating, but the moment he has finished it is legitimate and proper to fall upon him. To the lot of the women falls the cooking and the fetching of water.

Since matches have become an article of commerce, one seldom sees the natives using anything else, but occasionally a flint and steel is produced, and when neither flint and steel nor matches are forthcoming, a fire-drill is made. The fire-drill consists of a piece of soft dry wood in which a small groove is

cut; into this is inserted the point of a piece of hard wood, and the friction caused by this being turned very rapidly by a movement of the hands results in the smouldering of the small head of dust in the groove, from which a spark is soon obtained. Another of their appliances for the same purpose, outwardly resembles a kind of piston which is struck a sharp blow with the hand, whereupon, in some inexplicable manner, it produces a spark.

Fire is the medium through which people converse with the spirits and omen birds, in certain cases, as for instance, should a man hear the cry of a bird which is a bad omen, he lights a small fire telling it to protect him, and the fire is supposed to speak to the omen bird on his behalf. Another instance of the kind in which the fire would be thus regarded, is as follows:—A man has planted fruit trees and when they are in fruit, he places some round stones in cleft sticks near the trees and then proceeds to curse anybody who may venture to steal his fruit, calling these stones to witness the anathema. The curse invoked is somewhat of this nature, "May whoever steals my fruit suffer from stones in the stomach as large as these stones, and if necessary, become a figure of stone!" (*batu keidi*). Now supposing a friend passes by and wishes to gather some fruit for himself, he lights a fire and tells the flame to explain to the stone that he is a friend of the proprietor of the fruit and desires to eat thereof; the fire having explained all this satisfactorily to the stone, the visitor may safely pluck and eat, but woe betide a man who is not a friend and yet dares to take the fruit.

The houses usually stand about 20 feet above the ground on huge posts made of *billian*, and other hard woods, and sometimes are 400 yards in length and often hold over a hundred families; a shingle roofed verandah runs along the front of the house for its entire length, and from this there is a door leading to each room in the house, the said rooms each measuring some 7 yards in length by 3 in breadth and containing five people on an average. Excellent workmanship is displayed in the construction of these houses which are very massive throughout, the floors (to mention one item) being usually of planks about 30 feet long and 4 feet wide with a thickness of 2 inches. All the parts of the house are made ready for putting together, and then on a given day when the omens have been consulted, every man, woman, and child lends a hand, each contributing in one fashion or another a measure of assistance towards the labour of erecting the structure, and while this is proceeding a few small boys are told off to beat gongs and make a noise in order that bad omens may not be heard after a good augury has been obtained.

These long houses are sometimes erected in two or three days, all labouring to the greatest extent of their capacity, while the chief keeps order and gives directions, and the amount of work which is crowded into so short a space of time is wonderful to contemplate. The furniture of these dwellings consists of a fire-place, a few rude stools, and chairs carved out of one solid block of wood, are sometimes to be seen; huge slabs of wood, measuring 8 feet by 7 feet, are used for seats, and a description of shelves are sometimes put up in order to provide beds for the young unmarried men; mats, very neatly made of rattans, serve as sleeping mats, and to cover the floor; and the firewood is all stacked ready for use in the empty space above the room.

When a house was erected in the olden days, the first huge post put into the ground was put through the living body of a slave, usually a young girl, but happily such barbarous customs have been long abolished.

When an attack is expected the house is fortified by a sort of chevaux de frise placed round it, and though this is limp, the ends of the bamboo being pointed and very sharp make it a very difficult obstacle to break through. In addition to the foregoing, numbers of spikes of bamboo, burnt in order to harden them, are set in the ground in concealed and unexpected places and prove very destructive to naked feet.

The only cultivation attempted by the tribes of the interior is for the purpose of supplying their immediate wants and only such as is necessary to produce, rice, sweet potatoes, bananas, tobacco, sugar cane, and maize; the coastal people, however, grow a quantity of sago. The people of the interior collect rattans, gutta percha, india rubber, beeswax, camphor, and edible birds' nests. They have a few useful agricultural implements sufficient for their wants, such as a very handy axe (*beliong*), suitable for felling the forest before burning; a sort of chopper (*parang*), for cutting the undergrowth and light timber; a hoe for weeding in the paddy fields; and a description of pestle and mortar for husking the paddy. The Kayans are very good blacksmiths, possessing forges and anvils, and in former days they smelted their own iron; their workmanship is neat and serviceable, and the engraving with which they adorn their weapons, &c., is finished and artistic.

#### *Religion and Customs.*

The Kayans possess wooden idols called "*Odok*," but it is only on certain occasions that they are regarded as being of much importance. The interpretation of the cries of "Omen



Birds," and the inspection of pigs' livers constitute their highest forms of divination. The "Omen Birds" are the white headed black hornbill, the large hawk, the "*Talajan*," or rain bird, the bee-eaters, and a snake distinguished by a tail ending in a red tip, "*Untup*." When they wish to consult the gods as to whether some event of importance is likely to happen, or to obtain advice, a pig is brought in tied by the legs, and the chief talks to the pig, for this occasion, invoking it by the dignified title of "*Balli Boin!*" (literally "spiritual pig"); he then takes some burning embers and passes them round the back and sides of the animal, very close to the skin, but not touching it. Then he adjures the pig to speak the truth, and explains to him it is advisable to take such and such a step or not. After which the pig is killed, the blood being caught in a big gong and the carcass cut up and the liver taken out for inspection. If the liver is blotched or spotted, it is a very bad sign; if it is held together strongly by the larger blood-vessels, the position these bear to each other is considered; or if the gall bladder is in any way overlapping the liver, this is also taken as a sign that the omen is unfavourable. But, if the liver is healthy and free from all blemish then the omen is favourable, and the pig can be eaten. In some cases if the animal is a small one, it is placed in a cleft stick outside the house together with a few eggs and sometimes a fowl or so, in order that the spirits may regale themselves thereon, but that is usually in the case of a person suffering from some long illness, who wishes to make an offering to the gods when the omen has proved favourable.

Amongst the Kayans in former time, certain forms of the trial by ordeal were in vogue, such as thrusting their arms into a vessel of boiling water and recovering therefrom a small pebble to prove that their hands had touched the bottom, but this is now of very rare occurrence. However they still very occasionally settle small disputes by the practice of a custom known as *Menyallum* (diving). Take the case of a disputed ownership of a fruit tree, such as the durian, which after the lapse of twenty years from the date of planting, commences to bear fruit. Probably the original owner, *i.e.*, the planter, has been dead some years, and no one has paid any attention to the tree because hitherto it has borne no fruit; but no sooner is the tree in full fruit, than several lay claim to the crop.

The two principal disputants as to the ownership of the tree, agree to settle the matter by diving, and call together their friends to witness the trial, hundreds of people lining the banks of the river. The two men take up their positions in about 4 feet of water and each holds forth to the effect that he is the rightful owner, and prays that the water may trouble and enter



the mouth and nostrils of his opponent, calling on the birds and animals to witness his testimony. Two sets of cross-sticks have been driven into the mud at the bottom of the river leaving sufficient room for a man to get his head through, and on a given signal, each of the disputants diving into the water places his head under the cross-sticks, and holds on as long as he can. A friend holds the legs of each and is by this enabled to tell if his principal is going faint, and should the latter faint right off, it is the friend's duty to immediately pull him to the surface. The man who is able to keep under water for the greater length of time is declared the winner, and the loser is not allowed to make any further claim. Sometimes, however, the two men faint off simultaneously, and then the man who first recovers consciousness takes the prize. Very severe measures are resorted to to make them recover the more quickly, for in view of the contingency of both the men fainting a platform has been prepared, and a fire of shavings being lighted underneath, the half drowned man is placed on the platform and almost roasted. This rough treatment very soon causes one of the parties to regain his senses, and he is then held to have established his claim, and all the time this ordeal is proceeding the wildest excitement prevails amongst the friends of the rival claimants.

The Kayans have a curious, if somewhat childish, custom, of foretelling whether an absent friend is proceeding further from home or likely soon to return. A spear, usually about 7 or 8 feet long, is produced—if possible, the property of the absent one—and his nearest relative or some influential person taking the spear in his two hands, extends them apart along the shaft as far as he can reach. The distance between the two hands is marked on the spear-shaft with a piece of clay or something of that nature, and the man speaks to the spear, adjuring it to speak the truth, &c., and then stretches his hands apart again. If the length of his reach on the spear-shaft should measure more on the second trial than at the first attempt, it is taken as an indication that his friend is coming home; if it measures less, it means that he is going further away; while if it measures the same, it is a sign that his friend is resting in someone's house and has not yet made up his mind what he will do. A man will generally stretch further at his second attempt, for it is generally most probable that his friend has commenced his homeward journey, and in any case the thought of his so doing is at least comforting to his relations.

In order to consult the occult powers as to whether it is going to rain, or if it is expedient to make a journey on the following day, four bears' teeth each suspended by two strings, the opposite ends of which are all twisted together, constitute the necessary

mechanical medium. The person seeking information has to select two ends from the twisted mass of string, it being impossible for him to see with which tooth or teeth the strings he chooses are connected. The teeth are then let go, and the resulting tangle may be interpreted variously into eight favourable and eight unfavourable answers according to the relation the strings bear to the teeth, &c.

In taking an oath, the teeth of tiger-cats are employed; the person swearing holding the teeth in his hand and calling on them to harm him if he is not speaking the truth.

A man who has been suffering from a bad illness, on recovery will often change his name, in the hope that the evil spirit who caused his illness will be unable to recognise him under his new name. In such a case his former name is never again mentioned.

Kayans believe in a future state and in a supreme being—"Laki Tengangang." When the soul separates from the body, it may take the form of an animal or bird, and, as an instance of this belief, should a deer be seen feeding near a man's grave, his relatives would probably conclude that his soul had taken the form of a deer, and the whole family would abstain from eating venison for fear of annoying the deceased. The places for disembodied spirits are Tan Tekkan, Apo Leggan, Long Julan, and Tenyu Lallu. The mourners deposit various things with the dead, consisting for the most part of articles of apparel, weapons, and tools, and a small quantity of food. In olden days when a chief died, it was customary to bury living slaves along with the corpse; and only two years before the district came under Sarawak rule, three slaves were buried alive in the grave of one Balawing, a Kayan Chief of the Baram. The articles of clothing and weapons deposited with the dead, are of the highest value, no broken or damaged article being deemed worthy of a place in the grave, as they wish the spirit of the deceased to appear to advantage on his arrival in the other world, and from this it appears the belief is entertained that the articles are actually used. The funeral rites would require a complete paper for their adequate description, and cannot be further touched on here.

Spinning and weaving is practised but little by the Kayans, but almost all the other races in Borneo manufacture some kind of cloth. The Kayans use the bark of a tree to make coats and waistcloths, and I have even seen a mosquito curtain formed of this material. The patterns of these cloths are very artistic, the dye used being made from the fruit of the rattan, the juices of various roots, and the sap of some trees. The yellow dye used by the Dyaks is known as *Intamu* and the red as *Jeranang*.

They have no knowledge of the manufacture of glass or beads—a description of ornament of which both the Kayan men and women are very fond; some of the beads in their possession are very old and greatly prized by the owners, being valued by them from \$60 to \$100, and the most valuable of which are known as *Lukut Sekala*. Their armlets are usually of ivory, bought from the Chinese and other traders, and the women may sometimes be seen with as many as thirty bangles of ivory rings on each forearm.

The Kayans are a very musical race and possess many musical instruments. Amongst these are:—a reed organ (*kaluri*), a sort of banjo (*sapeh*), gongs (*tetawak*), drums (*gendang*), a jew's harp (*aping*), a bamboo harp (*paking*), and a nose flute (*silingut*).

The Kayans dry their tobacco in the shade, and it is not at all badly prepared; it is wrapped in the leaf of the wild banana, which dries almost like paper and has a peculiar scent, and is thus smoked in the form of a cigarette, a Kayan being seldom seen without one between his lips, for all the race are great smokers. In the ceremony of the blood-brotherhood, a drop of blood is often mixed with tobacco and smoked in a cigarette, the smoke being inhaled into the lungs in some cases, to show the sincerity of the bond.

Cupping is practised by the medicine men, small joints of bamboo being used for the purpose.

Blood-letting about the skin is a very common practice, and I have often seen a man take a small knife and make slight incisions in another's leg till the whole limb was smothered in blood.

As before stated, the Kayans and Kenniahs for years smelted their own iron, and the weapons made of that steel retain their value to the present day. They are great blacksmiths and skilful engravers on metal, some of their work bearing the closest examination. Their forge is an ingenious, if laborious, contrivance, consisting of several large bamboos into each of which a piston worked by hand forces the air; this is conducted by means of other bamboo tubes into one, the end of which forms as it were, the mouth of the bellows, and in which a considerably accumulated pressure of air is obtained. The anvil is likewise ingenious, being provided with many points and small holes by means of which the smith is enabled to bend and work his iron.

The Kayans are particularly fond of tattooing; the men more so than the women. A Kayan woman is tattooed on the upper part of the hands and over the whole of each forearm; on both thighs to below the knees, and on the upper part of the feet and toes. The pattern is so close that at a slight distance the tattooing appears simply as a mass of dark blue, and the designs—some of

which are very pretty—usually consist of a multiplicity of rings and circles. A man is supposed to tattoo one finger only, if he has been present when an enemy has been killed, but tattoos hands and fingers if he has taken an enemy's head. The chiefs, however, often break through this rule, and have the whole of their hands tattooed if they have been on a single war expedition. The Kenniah women do not tattoo their thighs and legs as much as the Kayans, but they usually have their feet and hands and forearms thus ornamented. The men have designs on the under-side of the forearm and sometimes on the thigh, and different races are characterised by different designs.

The Kalabits have long lines right down the arm from the biceps to the hand. The Punans tattoo but little. But a race of people called Bakatans tattoo their faces and chests to such an extent that only a small portion of the skin of those parts is free from it.

The teeth are filed by nearly all the races of Borneo at any age, and in many cases drilled with holes in which brass wire is inserted. Both the men and women of the Kayan and Kenniah races at the age of fifteen pluck out their eyebrows and eyelashes, and pierce holes in the ears of their children when the latter are from two to three years of age. From these holes—in the case of a girl—they hang heavy weights, adding to them yearly, till the opening in the elongated ear-lobe is sufficiently large to allow of the girl inserting through it her own head; in the case of some women I have seen as much as two pounds weight depending from the lobe of each ear. The men wear light earrings, and the lobes of their ears usually hang down about 2 inches.

None of the Kayan or Kenniah races wear nose or lip ornaments. The men of these two races wear only a cap or large tuft of long hair which hangs down the back, on the top of the head, all the rest of the scalp being shaven. This way of wearing the hair is, I consider, the last remnant of the Chinese pigtail, and I firmly believe that the Kayans, Kenniahs, and Punans are all descended from a Chinese stock.

The dress of the Kayan women is a cloth reaching from the hips to the ankles, tied at the hips, but open all down one side, leaving room for them to walk easily. They wear a string of beads round the waist, and a small ribbon of beads attached to some cloth is often worn on the head to confine the hair so that it shall fall evenly over the shoulders.

The costume of a Kayan warrior consists of a round cap (*lavong*), covered with hair of various colours, and two huge eyes to represent a face, with the long tail feathers of the hornbill stuck into the top; a war-jacket (*sunong*) made of a goat skin

with a butterfly worked in beads between the shoulders, and a large thick shell (*blasung*) on the breast, and the whole of the back covered with hornbills' feathers. Underneath this a quilted jacket is often worn as a protection against poisoned arrows, and a small mat about 18 inches long and a foot wide, hangs behind, and is used for sitting on when in the jungle. He carries a spear (*bakin*) in his right hand, and a shield (*kalavit*) in his left, while his long sword (*parang ilang*) in its sheath, is fastened round his waist on his left side, if he is a right handed man. He carries his rice and other small requirements in a description of basket (*sarut*), provided with two straps, on his back. Only chiefs, or those who are known as the "*bangsa rajah*," are allowed to wear the feathers of the helmeted hornbill, which is called by them *tebououl*, but they are not so particular about the feathers of the rhinoceros hornbill which are black and white, though a youth of no importance would not be allowed to wear even these. If a man has taken the head of an enemy, he is made much of by the women, and, if unmarried, mothers and fathers are anxious to secure him for a son-in-law.

Ivory is obtained from the traders, no elephants being found in the Kayan District, though they are often seen in large droves in the northern part of Borneo, and the Kayans have adopted the Malay name of *gajah* for them, possessing no word of their own to describe these animals.

The Kayans are great wood carvers, and if some of their work is rough, most of it is very pretty and artistic in design. It generally represents fruits, leaves, and creepers, or human figures, and they usually employ a not very hard, but tough, wood, known to them as *meddang* and *maranti* for this purpose.

Prior to the cession of the Baram district to Sarawak by the Sultan of Brunei, money was not used, and the trade consisted of merely an exchange of jungle produce for cotton goods, grey shirting, turkey red and yellow cloth. The district has now been under Sarawak rule for ten years, and in consequence of the enormous increase of trade, the current dollars and cents have found their way far into the interior, so that even the Punans know the purchasing power of dollars, and it is common now to see the dollar coin on necklaces worn by children.

The Kayans, and many other races in Borneo, fix the time of the year for planting paddy, by observing the position of the stars, though it is more usual for Kayans to be guided by the sun. In the case of reckoning by the stars, they consider that when the Pleiades appear just above the horizon as daylight breaks (five o'clock) that the right time of the year for sowing has arrived. But paddy may be planted and produce a good crop within three months; the low country people are much



later than the hill people, and those who plant swamp paddy even later still. The Kayans measure the shadow of the sun from a horizontal post at twelve o'clock; other shadows cross the large shadow, and the man in charge of this sun-dial has various scales on pieces of wood, but these, and the methods of calculation, together with the sun-dial, which is enclosed by a high fence, are all kept a close secret. But I must admit that they are able to reckon by these measurements how long it is to the time of planting, and I have found that they do not vary much one year from another. I hope some day to have all this explained to me.

A man wishing to describe the time he will be away, says, "I shall be away so many nights," not, so many days. If asked what time you will arrive, he will answer, "when the sun is in *that* position," pointing to the sky; if wishing to indicate night-fall, he will say, "when the sun has gone under"; and early dawn, "when the sun has come up." A man desirous of describing a fish he has caught, would say it was as big as his forearm, or if larger, as big as the calf of his leg. The graduated scale of measurements they use, are:—the size of the thumb; two fingers; three fingers; four fingers; the wrist; the forearm; the calf of the leg; then the thigh or the head; and lastly, the body.

As an equivalent for our inches and feet the natives use fingers—one, two, three, four; four fingers constituting the breadth of a hand; their span consists of that between the thumb and first finger, and a long span, in some cases, between the thumb and second finger, but the latter measurement is not generally allowed, as the following story will show. I was once, while seated in a house talking to the chief, a witness of a heated dispute which took place between two of his followers anent the sale of a pig. A pig is sold by measurement, the measurement being taken (by means of a string) of the girth of the body just behind the fore-legs; and for every spans-length of string, a dollar has become the fixed price. Now the buyer wanted to use the span of the second finger and thumb; the seller of course objected, as in a large pig the use of the longer span would materially decrease the price. After a heated discussion, both parties appealed to their chief to give a decision. I was anxious to see how the old chief would get out of the difficulty, as it was evident he did not wish to offend either of them, and, on the whole, I think he managed very cleverly.

Both the disputants sat down in front of him and explained the point of contention, whereupon he said to the buyer, "now if you were pointing at a man," (pointing at a man's eyes is a form of insult) "and were to do it with your second finger," (at



the same time pointing with *his* second finger), "how foolish it would look, would it not?" The buyer was obliged to admit that it would be so. "Well then," said the chief, "the first finger is the one to use, and we won't adopt any new fads in this house." The two men went away, satisfied with the chief's decision, and the pig was sold.

Many of the tribes adopt the names of animals and common objects such as—*Lang*, a hawk; *Bangau*, a stork; *Apoi*, fire, and so on. Amongst the Kalabits, a chief who wishes to impress people with his greatness often adds the word *langit*, the heavens, to his other names. This implies that he is a very important personage, literally, that the heavens belong to him.

When a child is born, the father and mother sink their own identity, and adopt the name of their offspring. Supposing a man named Jau becomes the parent of a son to whom he gives the name of Lahing, the former would no longer be called Jau, but Taman Lahing, father of Lahing. If his child were to die, he would be called Ozong Lahing, or Ozong Jau; if his wife dies, he adds the prefix Aban (widower) to his name; if a brother or sister, Boi, and is called Boi Lahing. Should he attain the position of being a grandfather, he becomes Laki, adding thereto the name of his grandchild, so if the latter is given the name of Ngipa, the grandfather is no longer called Taman Lahing, or by any other name but Laki Ngipa. A widow is called Ballo.

Many fruits are forbidden, and some articles of diet which may be eaten singly, may not be taken together, as for instance the young leaves in the heart of the beal nut tree (*Arica palm*) known as the cabbage, which may be made into salad, or eaten when cooked, but if mixed with a small fish known as Saluang, it causes violent convulsions. The fish, which is a particularly good one, may, however, be eaten alone.

The system of "taboo" is greatly practised by the Kayans during the times of planting and harvesting the crops, and more especially when the paddy is being stored. At such a time none may enter the house but those residing in it, and even they may not enter each other's rooms, the reason for this prohibition being simply that the people do not wish the extent of their harvest to be known. Anyone may taboo his own room, but it is the chief, who, with the advice of his followers, taboos the house or the river. Small fines are imposed for infringing the taboo, if it is done unintentionally, but in the case of a man forcing his way in a house that is tabooed, a serious quarrel is often the result, and this has sometimes ended in bloodshed, but it is a very rare thing to find a man acting thus, as all the people have some form of taboo in their own houses. After the

harvest, a great deal of drinking and merry making is indulged in, and at this time a great many marriages take place.

There are certain times when the relatives of a deceased person visit his grave, but without there is some special reason, such as a division of property amongst the descendants of the dead, this is but seldom done. The name of one who has died, is not mentioned in the same manner as whilst he was living; the Kayans put the word *urip* before his name which signifies "the spirit of the deceased."

The Kayan and Kenniah chiefs are much looked up to by their followers, and have great power over the people; they are usually very intelligent and well-behaved men, and have the manners of gentlemen rather than of savages.

#### DISCUSSION.

Sir H. Low: I have listened with great pleasure to the very interesting paper by Mr. Hose. The Punans and the Kyans are amongst the less known of the tribes of Borneo, and although I was not in the districts they chiefly inhabit, I had opportunities occasionally of meeting them, and can certify to the very accurate description which Mr. Hose has given of them. I congratulate him on the opportunities he will have in the future for further studying these interesting tribes, and have no doubt that we may look upon the valuable paper which has been read to us, as an earnest of further information which he will collect for this Institute and through it for European science.

The interesting points in the lecture were so numerous that one's memory fails to follow them on the spur of the moment.

I once met with two families of Panans in the mountains of the Lawas river, opposite to the island of Labuan. These consisted of two men, three women, and three children. They were of a lightish brown colour, with pleasing features, gentle manners, and of graceful figures and had been living for about two months in the spot in which I saw them. Their only shelter was formed by a few palm leaves stuck at an angle by their stems in the ground and they said they were about to move from this place, as game was becoming scarce. From a cross bar resting at either end on two forked poles stuck into the ground, hung about twenty lower jaws of the large wild pig of Borneo (*Sus verrucosus*), with other trophies of their successful hunt. Their weapons were the sumpitan or blow pipe, spears and chopping knives, and they told me that they were the sole survivors of a community of more than fifty families, of which the oldest man, about forty years of age, remembered the tribe to have consisted. They planted no rice or other vegetables, but lived entirely on the wild animals and vegetable produce of the primeval forest in which I found them. They were very grateful for a little tobacco with which we supplied

them. The Kyans I occasionally saw on rare visits which some of their chiefs made to Labuan, and I quite concur in the opinion of Mr. Hose as to the relative character and capacity for development of the Dyaks, Kyan, and Punan races of Borneo. With regard to the Mongolian features which are so very apparent on some of the excellent slides exhibited, it is to be remarked that, if a Chinese ancestry is responsible for this, it is curious that not only in the tribes under consideration, but amongst the Dusuns of the rivers in the territory of the N. Borneo Company, where Chinese descent rests on undoubted evidence, no trace of the language is to be found in the dialects at present in use. It is recorded in the Annals of the Kingdom of Borneo, that, in the latter half of the 15th century A.D., the daughter of the first Mahommedan Sultan of Borneo was married to one of the commanders of an expedition which had been sent by the Emperor of China to endeavour to procure the famous jewel, supposed to be guarded by the dragon of the great mountain Kina Babi. This officer, named Ong Sum Ping, on the return of the expedition to China, elected to remain with many of his followers in Borneo, embraced the religion of Islam, and under the name of Sultan Achmed became the second independent sovereign of the kingdom which had before been a dependency of the Hindu Kingdom of Majapahit in Java. From this time, intercourse with China seems to have been frequent down to the end of the last century, and many settlers of that nation were found living as pepper planters and cultivators in Borneo, when, about 1774, the East India Company established a trading factory in the town of Brunei. This factory was subsequently withdrawn and intestine troubles were so unfavourable to the Chinese settlers that no trace of these remain near the capital, though descendants of the race are found in the outlying rivers, who have adopted the language and habits of the Dusuns. Emigrants from China, till about thirty years ago, consisted of men only. When they settled in Borneo, they married women of the native race, which of course tended to the absorption of their descendants into the national stock. The first poison mentioned in the paper is derived from the juice of the roots of the *Derris Elliptica*, a papilionaceous plant, with a pendulous raceme of flowers resembling those of the *Wistaria*, but of a purple plum colour and with a rich perfume. The poison used for the darts of the blow pipe or sumpitan is derived from the sap of the celebrated Upas tree, is called Ipoh in Brunei and in the Malay Peninsula, and which, when properly prepared, is a very active poison. A very interesting article on this poison may be found in the Bulletin of the Kew Royal Botanic Gardens for 1891, at p. 259; plants of this tree, *Antiaris toxicaria* and the *Derris Elliptica*, may be seen in Kew Gardens. The sumpitan or blow pipe used by the Kyans is made of very hard wood, and the bore is drilled with the greatest accuracy.

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## ANTHROPOLOGICAL MISCELLANEA AND NEW BOOKS.

### Address to the Anthropological Section of the British Association.

By ROBERT MUNRO, M.A., M.D., F.R.S.E.,  
*President of the Section.*

THE science of anthropology, in its widest sense, embraces all the materials bearing on the origin and history of mankind. These materials are so comprehensive and diversified, both in their character and methods of study, that they become necessarily grouped into a number of subordinate departments. From a bird's-eye point of view, however, one marked line of demarcation separates them into two great divisions, according as they relate to the structure and functions of man's body, or to the works he has produced—a classification well defined by the words *anthropology* and *archæology*. The former, in its limited acceptation, deals more particularly with the development of man—his physical peculiarities, racial distinctions, linguistic manifestations, mental endowments, and, in short, every morphological or mental modification he has undergone amidst the ever-changing phenomena of his environments. The latter, on the other hand, takes cognisance of man merely as a handicraftsman. During his long journey in past time he has left behind him, scattered on the highways and byways of primeval life, numerous traces of his ways, his works, his culture, and his civilisation, all of which fall to be collected, sorted, and interpreted by the skilled archæologist. In their general aspects and relationship to each other most of the leading subjects in both these branches of the science have already been expounded in the presidential addresses of my predecessors, by men so distinguished in their respective departments that they have left little to be said by anyone who attempts to follow in their footsteps. There is, however, one phase in the progressive career of man which has not hitherto been so fully illustrated as the subject appears to me to merit. I refer to the direct and collateral advantages which the erect position has conferred on him; and to this I will now briefly direct your attention, concentrating my observations successively on the following propositions:—

(1) The mechanical and physical advantages of the erect position.

(2) The differentiation of the limbs into hands and feet.

(3) The relation between the more perfect condition of these organs and the development of the brain.

In the process of organic evolution it would almost appear as if nature acted on teleological principles, because many of her products exhibit structures which combine the most perfect adaptation of means to ends along with the greatest economy of materials. This is well exemplified in some of the structural details of the organs of locomotion in which many of the so-called mechanical powers may be seen in actual use. The primary object of locomotion was to enable the organism to seek its food over a larger area than was attainable by a fixed position. The acquisition of this power was manifestly so advantageous to animal life that the principles by which it could be effected became important factors in natural selection. I need not here dwell on the various methods by which this has been accomplished in the lower forms of life, but proceed at once to point out that in the higher vertebrates the problem resolved itself into the well-known mechanism of four movable limbs, capable of supporting and transporting the animal. As these quadrupedal animals became more highly differentiated, in virtue of the necessities of the struggle for life and the different and ever-varying conditions of their surroundings, it followed that the limbs became also modified so as to make them suitable, not only for locomotion in various circumstances, but also useful to the animal economy in other ways. Hence they were subjected to an endless variety of secondary influences, which finally adapted them for such divers purposes as swimming, flying, climbing, grasping, &c. The anterior limbs, owing to their proximity to the head, were more frequently selected for such transformations as may be seen, for instance, in the wings of a bird. But whatever modifications the fore limbs may have undergone, no animal, with the exception of man, has ever succeeded in divesting them altogether of their primary function. This exceptional result was due to the erect position, which necessitated a complete division of labour as regards the function of the limbs—the two anterior being entirely restricted to manipulative and prehensile purposes, and the two posterior exclusively devoted to locomotion. Coincident with this notable specialisation of their function a new field for advancement was opened up to man, in which intelligence and mechanical skill became the leading factors in his further development.

Man is thus distinguished from all other animals by the fact that, in the normal position of walking or running, he carries his body upright, *i.e.*, with the axis of the vertebral column perpendicular, instead of horizontal or oblique. In this position all its parts are so arranged as to require a minimum amount of exertion in the performance of their functions. If any of the other higher vertebrates should ever assume an erect attitude it can only be maintained temporarily, and its maintenance involves an additional



expenditure of force. In a certain sense a bird may be looked upon as a biped, but there is this distinction to be drawn between it and man, viz., that the former has not only its body balanced obliquely on its two legs, but also its fore limbs converted into special organs for motion in the air. The anthropoid apes hold an intermediate position, and so carry their body in a semi-erect attitude. But this shortcoming in reaching the perfectly upright position, however slight it may be in some of these animals, represents a wide gap which can only be fully appreciated by a careful study of the physiological and psychological phenomena manifested in their respective life-functions.

Everyone acquainted with the ordinary operations of daily life knows how much labour can be saved by attention to the mere mechanical principles involved in their execution. In carrying a heavy load the great object is to adjust it so that its centre of gravity comes as nearly as possible to the vertical axis of the body, as otherwise force is uselessly expended in the effort to keep the entire moving mass in stable equilibrium—a principle well exemplified by the Italian peasant girl when she poises her basket of oranges on her head. Once upon a time a powerful waterman, accustomed to use buckets double the size of those of his fellow-watermen, had the misfortune to have one of them broken. As he could not, then and there, get another bucket to match the remaining one, and wishing to make the best possible use of the appliances at hand, he replaced the broken vessel by one half its size. He then filled both with water and attempted to carry them, as formerly, attached to a yoke, one on each side of him. But to his astonishment this arrangement would not work. The yoke became uneven, and the effort to keep it balanced on his shoulders was so troublesome that he could not proceed. This emergency led to serious reflection, but, after some experimental trials, he ascertained that, by merely making the arm of the yoke on which the small bucket was suspended double the length of the other, he could carry both buckets without inconvenience.

But let me take one other illustration. Suppose that two burglars have concocted a plan to rob a richly-stored mansion by getting access to its rooms through the windows of an upper story. In order to carry out this design they secure a ladder, easily transported by the two together though too heavy for one. So, bearing the ladder between them one at each end, they come to the house. After a considerable amount of exertion they succeed in placing the ladder in an upright position against the wall, and then one of the men mounts its steps and enters the house. The man left outside soon realised that, once the ladder was balanced perpendicularly, he himself could then easily control it. Moreover, he made the discovery that by resting its weight on each leg alternately, he could gradually shift its position from one window to another. Thus there was no interruption or limit to the extent of their depredations. Experience quickened their perceptions, and ultimately they become adepts in their respective departments—the



one in the art of moving the ladder, and the other in the science of the nimble-fingered gentry. The division of labour thus practised by these two men accurately represents what the attainment of the erect attitude has accomplished for man by setting free his upper limbs from any further participation in the locomotion of his body.

The continued maintenance of this unique position necessitated great changes in the general structure of the body. The solution of the problem involved the turning of the ordinary quadruped a quarter of a circle in the vertical plane, thus placing the axis of the spine perpendicular, and consequently in line with the direction of the posterior limbs: and to effect this the osseous walls of the pelvis underwent certain modifications, so as to bear the additional strain put upon them. Stability was given to the trunk in the new position by the development of special groups of muscles, whose powerful and combined actions render to the movements of the human body their characteristic freedom and gracefulness. The lower limbs were placed as widely apart as possible at their juncture with the pelvis, and the thigh and leg-bones were lengthened and strengthened so as to be capable of supporting the entire weight of the body and of transporting it with due efficiency when required. The spinal column assumed its well-known curves, and the skull, which formerly had to be supported by a powerful muscle attached to the spinous processes of the cervical vertebræ (*ligamentum nuchæ*), moved backwards until it became nearly equipoised on the top of the vertebral column. The upper limbs, instead of taking part in their original function of locomotion, were now themselves carried as flail-like appendages, in order to give them as much freedom and range of action as possible. The shoulder-blades receded to the posterior aspect of the trunk, having their axes at right-angles to that of the spine. Further, like the haunch-bones, they underwent certain modifications, so as to afford points of attachment to the muscles required in the complex movements of the arms. In the pendulous position each arm has its axis at right angles to that of the shoulder, but by a common muscular effort the two axes can be readily brought into line. The elbow-joint became capable of performing the movements of complete extension, flexion, pronation, and supination—in which respects the upper limb of man is differentiated from that of all other vertebrates.

But it is in the distal extremities of the limbs that the most remarkable anatomical changes have to be noted. The foot is virtually a tripod, the heel and the ball of the great toe being the terminal ends of an arch, while the four outer digital columns group themselves together to form the third, or steadying, point. The outer toes thus play but a subordinate part in locomotion, and, as their prehensile function is no longer of use, they may be said to be fast approaching to the condition of rudimentary organs. The three osseous prominences which form this tripod are each covered with a soft elastic pad, which both facilitates progression and acts

as a buffer for deadening any possible shock which might arise in the course of running or leaping. The chief movement in the act of progression is performed by an enormously developed group of muscles known as the calf of the leg, so characteristic of man. The walker is thereby enabled to use the heel and the ball of the great toe as successive fulcrums from which the forward spring is made, the action being greatly facilitated by that of the trunk muscles in simultaneously bending the body forwards. The human foot is thus admirably adapted both as a pillar for supporting the weight of the body, and a lever for mechanically impelling it forwards. Hence the amount of energy expended in progression is reduced to a minimum, and when estimated proportionally to the size of the body it is believed to be considerably less than that requisite for the corresponding act in quadrupeds.

The anatomical changes effected in the extremity of the upper limb are equally radical, but of a totally different character and scope. Here we have to contemplate the transformation of the same homologous parts into an apparatus for performing a series of prehensile actions of the most intricate character, but among which neither locomotion nor support of the body forms any part whatever. This apparatus is the human hand, the most complete and perfect mechanical organ nature has yet produced. The fingers have become highly developed, and can be opposed singly or in groups to the thumb, so as to form a hook, a clasp, or a pair of pincers; and the palm can be made into a cup-shaped hollow, capable of grasping a sphere. Nor is there any limit to the direction in which many of these manipulations can be performed without any movement of the rest of the body. For example, a pencil held by the thumb and the two forefingers, as in the act of writing, can be placed in all the directions of space by a mere act of volition acting through the muscles of the fore limb alone.

The position of such a perfect piece of mechanism, at the extremity of a movable arm attached to the upper part of the trunk, gives to man a superiority in attack and defence over all other animals, on the same principle as a soldier finds it advantageous to fight from higher ground. Moreover, he possesses the power to perform a variety of quick movements, and to assume attitudes and positions eminently adapted for the exercise of that manipulative skill with which he counteracts the superior brute force of many of his antagonists. He can readily balance his body on one or both legs, can turn on his heels as if they were pivots, and can prostrate himself comfortably in the prone or supine positions. As the centre of gravity of the whole body is nearly in line with the spinal axis, stable equilibrium is easily maintained by the lumbar muscles. Altogether we have in his physical constitution a combination of structures and functions sufficiently unique in its *tout-ensemble* to place man in a category by himself. But at the same time we must not forget that all his morphological peculiarities have been brought about without the destruction of any of the primary homologies common to all the higher vertebrates.

Turning now to the brain, the undoubted organ of the mind, we find, in its intellectual and psychical manifestations, a class of phenomena which gives to man's life-functions their most remarkable character. However difficult it may be for our limited understanding to comprehend the nature of conscious sensation, we are forced to the conclusion that the act invariably takes place through the instrumentality of a few nerve-cells, whose functional activity requires to be renovated in precisely the same manner as the muscular force expended in walking. The aggregation of such cells into ganglia and nerves, by means of which reflex action, consciousness, and a variety of psychical phenomena take place, is found to permeate, in a greater or less degree, the whole of the organic world. In the higher vertebrates the seat of these manifestations is almost exclusively confined to an enormous collection of brain substance placed at the upper end of the vertebral column, and encased in a complete osseous covering called the skull. We learn from numerous experimental researches, carried out by physiologists in recent years, that the brain is a dual organ, consisting of a double series of distinct ganglia and connected to some extent by a complex system of nervous tissues, not only with each other, but with the central seat of consciousness and volition. But the difficulty of determining the nature of its functions and the *modus operandi* of its psychological manifestations, is so great that I must pass over this part of the subject very lightly indeed. The conditions of ordinary reflex action require that a group of muscles, by means of which a particular bodily movement is effected, shall be connected with its co-ordinating ganglion by an afferent and an efferent system of nerves. Impressions from without are conveyed by the former, or sensory nerves, to the central ganglion, from which an impulse is retransmitted by the motor nerves and sets in operation the muscular force for producing the required movement. But this efferent message is, in many cases, absolutely controlled by volition, and not only can it prevent the muscular action from taking place, but it can effect a similar movement, *de novo*, without the direct intervention of external impressions at all. Now it has been proved experimentally that the volitional stimulus, which regulates the various movements of the body, starts from definite portions of the brain according to the different results to be produced. This localisation of brain functions, though still far from being thoroughly understood, comes very appropriately into use in this inquiry. From it we learn that the homology which characterises the structural elements of the bodies of animals extends also to the component parts of their respective brains. The law which differentiates animals according to the greater specialisation of the functions of their various organs has therefore its counterpart in the brain, and we naturally expect an increase of brain substance in every case in which the functional activity of a specific organ is extended. Thus the act of stitching with a needle and thread, an act beyond the mental and physical capacity of any animal but man, would entail a

certain increase of brain substance, simply in obedience to the great complexity of the movements involved in its execution, over and above that which may be supposed to be due to the intellectual and reasoning faculties which invented it.

That man's brain and his intelligence are correlated to each other is a fact too axiomatic to require any demonstration; nor can it be doubted that the relationship between them is of the nature of cause and effect. But to maintain that the amount of the latter is directly proportional to the size of the former is rather straining the laws of legitimate inference. In drawing any general conclusion of this nature from the bulk of brain substance, there are some modifying influences which cannot be disregarded, such, for example, as the amount of cranial circulation and the quality of the brain cells. But the determination of this point is not the exact problem with which the evolutionist is primarily concerned. To him the real crux in the inquiry is to account for the evolution of man's comparatively large brain under the influence of existing cosmic forces. After duly considering this problem, and casting about for a possible explanation, I have come to the conclusion that not only is it the result of natural laws, but that one of the main factors in its production was the conversion of the upper limbs into true hands. From the first moment that man recognised the advantage of using a club or a stone in attacking his prey or defending himself from his enemies, the direct incentives to a higher brain development came into existence. He would soon learn by experience that a particular form of club or stone was more suitable for his purposes; and if the desiderated object were not to be found among the natural materials around him, he would proceed to manufacture it. Certain kinds of stones would be readily recognised as better adapted for cutting purposes than others, and he would select his materials accordingly. If these were to be found only in a special locality, he would visit that locality whenever the prized material was needed. Nor would it be an unwarrantable stretch of imagination to suppose that the circumstances would lead him to lay up a store for future use. These simple acts of intelligence assume little more than may be seen in the actions of many of the lower animals. Consciousness of his power to make and to wield a weapon was a new departure in the career of man, and every repetition of such acts became an effective and ever-accumulating training force. What a memorable event in the history of humanity was the manufacture of the first sharp stone implement! Our sapient ancestor, who first used a spear tipped with a sharp flint, became possessed of an irresistible power over his fellow men. The invention of the bow and arrow may be paralleled with the discovery of gunpowder and the use of cannon, both of which revolutionised the principles of warfare in their respective ages. The art of making fire had a greater influence on human civilisation than the modern discovery of electricity. The first boat was in all probability a log—an idea which might have been

suggested by the sight of an animal clinging to a floating piece of wood carried away by a flood. To scoop this log into a hollow boat was an after-thought. The successive increments of knowledge by which a single-tree canoe has been transformed into a first-class Atlantic liner are scattered through the unwritten and written annals of many ages. In his expeditions for hunting, fishing, fruit-gathering, &c., primitive man's acquaintance with the mechanical powers of nature would be gradually extended, and *pari passu* with the increasing range of his knowledge there would be a corresponding development in his reasoning faculties. Natural phenomena suggested reflections as to their causes and effects, and so by degrees they were brought into the category of law and order. Particular sounds would be used to represent specific objects, and these would become the first rudiments of language. Thus each generalisation when added to his previous little stock of knowledge widened the basis of his intellectual powers, and as the process progressed man would acquire some notion of the abstract ideas of space, time, motion, force, number, &c.; and continuous thought and reasoning would ultimately become habitual to him. All these mental operations could only take place through the medium of additional nerve cells, and hence the brain gradually became more bulky and more complex in its structure. Thus the functions of the hand and of the brain have been correlated in a most remarkable manner. Whether the mechanical skill of the hand preceded the greater intelligence of the brain, or *vice versa*, I will not pretend to say. But between the two there must have been a constant interchange of gifts. According to Sir C. Bell, "the hand supplies all instruments, and by its correspondence with the intellect gives him universal dominion."<sup>1</sup>

That mind, in its higher psychical manifestations, has sometimes been looked upon as a spiritual essence which can exist separately from its material basis, need not be wondered at when we consider how the pleasing abstractions of the poet, or the fascinating creations of the novelist, roll out, as it were, from a hidden cavern without the slightest symptom of physical action. It is this marvellous power of gathering and combining ideas, previously derived through the ordinary senses, which gives a *primâ facie* appearance of having here to deal with a force exterior to the brain itself. But indeed it is questionable if such psychological phenomena are really represented by special organic equivalents. May they not be due rather to the power of volitional reflection which summons them from the materials stored up by the various localised portions into which the brain is divided? From this point of view there may be many phases of pure cerebration which, though not the result of direct natural selection, have nevertheless as natural and physical an origin as conscious sensation. Hence imagination, conception, idealisation, the moral faculties, &c., may be compared to parasites which live at the expense of their neighbours. After all the greatest mystery of life lies in the

<sup>1</sup> "The Hand, &c.," Bridgewater Treatise, p. 38.



simple acts of conscious sensation, and not in the higher mental combinations into which they enter. The highest products of intellectuality are nothing more than the transformation of previously existing energy, and it is the power to utilize it that alone finds its special organic equivalent in the brain.

But this brings us on controversial ground of the highest importance. Professor Huxley thus expresses his views on the phase of the argument now at issue:—

"I have endeavoured to show that no absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves; and I may add the expression of my belief that the attempt to draw a psychical distinction is equally futile, and that even the highest faculties of feeling and of intellect begin to germinate in lower forms of life."

On the other hand, Mr. Alfred R. Wallace, who holds such a distinguished position in this special field of research, has promulgated a most remarkable theory. This careful investigator, an original discoverer of the laws of natural selection, and a powerful advocate of their adequacy to bring about the evolution of the entire organic world, even including man up to a certain stage, believes that the cosmic forces are insufficient to account for the development of man in his civilised capacity. "Natural selection," he writes, "could only have endowed savage man with a brain a few degrees superior to that of an ape, whereas he actually possesses one very little inferior to that of a philosopher." This deficiency in the organic forces of nature he essays to supply by calling in the guiding influence of a "superior intelligence." In defending this hypothesis from hostile criticism he explains that by "superior intelligence" he means some intelligence higher than the "modern cultivated mind," something intermediate between it and Deity. But as this is a pure supposition, unsupported by any evidence, and, so far as I can see, merely a matter of personal belief, it is unnecessary to discuss it further. I would just, *en passant*, ask Mr. Wallace why he dispenses with this "higher intelligence" in the early stages of man's evolution, and finds its assistance only requisite to give the final touches to humanity?

In dealing with the detailed objections raised by Mr. Wallace against the theory of natural selection as applied to man, we are, however, strictly within the sphere of legitimate argument; and evolutionists are fairly called upon to meet them. As his own theory is founded on the supposed failure of natural selection to explain certain specified peculiarities in the life of man, it is clear that if these difficulties can be removed, *cadit questio*. It is only one of his objections, however, that comes within the scope of my present enquiry, viz., that which is founded on the supposed "surplusage" of brain power in savage and prehistoric races.

In comparing the brains of the anthropoid apes and man Mr. Wallace adopts the following numbers to represent their proportional

<sup>1</sup> "Evidences as to Man's Place in Nature," p. 109.



average capacities, viz., anthropoid apes 10, savages 26, and civilised man 32—numbers to which there can be no objection, as they are based on data sufficiently accurate for the requirements of this discussion. In commenting on the mental ability displayed in actual life by the recipients of these various brains he states that savage man has “in an undeveloped state faculties which he never requires to use,” and that his brain is much beyond his actual requirements in daily life. He concludes his argument thus:—“We see, then, that whether we compare the savage with the higher developments of man, or with the brutes around him, we are alike driven to the conclusion that in his large and well-developed brain he possesses an organ quite disproportionate to his actual requirements—an organ that seems prepared in advance, only to be fully utilised as he progresses in civilisation. A brain one-half larger than that of the gorilla would, according to the evidence before us, fully have sufficed for the limited mental development of the savage; and we must therefore admit that the large brain he actually possesses could never have been solely developed by any of those laws of evolution whose essence is that they lead to a degree of organisation exactly proportionate to the wants of each species, never beyond those wants; that no preparation can be made for the future development of the race; that one part of the body can never increase in size or complexity, except in strict co-ordination to the pressing wants of the whole. The brain of prehistoric and of savage man seems to me to prove the existence of some power distinct from that which has guided the development of the lower animals through their ever-varying forms of being.”<sup>1</sup>

With regard to the closing sentence of the above quotation, let me observe that the cosmic forces, under which the lower animals have been produced by means of natural selection, do not disclose, either in their individual or collective capacity, any guiding power in the sense of a sentient influence, and I believe that the “distinct power” which the author summons to his aid, apparently from the “vasty deep,” to account for the higher development of humanity is nothing more than the gradually acquired product of the reasoning faculties themselves. Not that, for this reason, it is to be reckoned less genuine and less powerful in its operations than if it had emanated from an outside source. The reasoning power displayed by man is virtually a higher intelligence, and, ever since its appearance on the field of organic life, it has, to a certain extent, superseded the laws of natural selection. Physical science has made us acquainted with the fact that two or three simple bodies will sometimes combine chemically so as to produce a new substance, having properties totally different from those of either constituents in a state of disunion. Something analogous to this has taken place in the development of man's capacity for reasoning by induction. Its primary elements, which are also those of natural selection, are conscious sensation, heredity, and a few other properties of organic matter, elements which are common, in a more or less degree, to all

<sup>1</sup> “Natural Selection, &c.,” 1891, p. 193.

living things. As soon as the sequence of natural phenomena attracted the attention of man, and his intelligence reached the stage of consecutive reasoning on the invariableness of certain effects from given causes, this new power came into existence; and its operations are, apparently, so different from those of its component elements that they can hardly be recognised as the offspring of natural forces at all. Its application to the adjustment of his physical environments has ever since been one of the most powerful factors, not only in the development of humanity, but in altering the conditions and life-functions of many members of the animal and vegetable kingdoms.

I have already pointed out that the brain can no longer be regarded as a single organ, but rather as a series of organs connected by bonds of union—like so many departments in a Government office in telephonic communication—all, however, performing special and separate functions. When, therefore, we attempt to compare the brain capacity of one animal with that of another, with the view of ascertaining the quality of their respective mental manifestations, we must first determine what are the exact homologous parts that are comparable. To draw any such inference from a comparison of two brains, by simply weighing or measuring the whole mass of each, would be manifestly of no scientific value. For example, in the brain of a savage the portion representing highly skilled motor energies might be very much larger, while the portion representing logical power might be smaller than the corresponding parts in the brain of a philosopher. But should these inequalities of development be such as to balance each other, and the weight of the two organs become equal, what, in this case, could be the value of any inference as to the character of their mental endowments? Equal-sized brains do not display equivalent, nor indeed analogous, results. To postulate such a doctrine would be as irrational as to maintain that the walking capacities of different persons are directly proportional to the weight of their bodies. Similar remarks are equally applicable to the skulls of prehistoric races, as it would appear that evolution had done the major part of its work in brain development long before the days of neolithic civilisation. Huxley's well-known description of the Engis skull—"a fair average skull, which might have belonged to a philosopher, or might have contained the thoughtless brains of a savage"—goes far to settle the question from its anatomical point of view. Until localisation of brain functions makes greater progress it is, therefore, futile to speculate, to any great extent, on the relative sizes of the skulls of different races either in present or prehistoric times.

But there is another aspect of the question which militates against Mr. Wallace's hypothesis, viz., the probability that many of the present tribes of savages are, in point of civilisation, in a more degenerate condition than their forefathers who acquired originally higher mental qualities under natural selection. There must surely be some foundation of truth in the widely-spread tradition of the fall of man. And, if such be the case, we naturally expect to find

some stray races with inherited brains of greater capacity than their needs, in more degenerate circumstances, may require. An exact equivalent to this may be seen in the feeble intellectuality of many of the peasants and lower classes among the civilised nations of modern times. Yet a youth born of such parents, if educated, often becomes a distinguished philosopher. It is well known that if an organ ceases to perform its functional work it has a tendency to deteriorate and ultimately to disappear altogether. But from experience we know that it takes a long time for the effects of disuse to become manifest. It is this persistency that accounts for a number of rudimentary organs, still to be met with in the human body, whose functional activity could only have been exercised before man became differentiated from the lower animals. Such facts give some support to the suggestion, previously made, that philosophising, as such, has no specially localised portion in the brain. Its function is merely to direct the current of mental forces already existing.

But, again, Mr. Wallace's argument involves the assumption that the unnecessarily large brain of the savage had been constructed on teleological principles for the sole purpose of philosophising. My opinion is that the greater portion of this so-called surplusage is the organic representative of the energy expended in the exercise of the enormous complexity of human actions, as displayed in the movements of his body and in the skilful manipulations necessary to the manufacture of implements, weapons, clothing, &c. All such actions have to be represented by a larger bulk of brain matter than is required for the most profound philosophical speculations. The kind of intelligence evinced by savages, however low their position in the scale of civilisation may be, is different from, and incomparably greater than, that manifested by the most advanced of the lower animals. To my mind it is much more rational to suppose that the development of the large brain of man corresponded, *pari passu*, with that of his characteristic physical attributes, more especially those consequent on the attainment of the upright position. That these attributes were acquired exclusively through the instrumentality of the cosmic forces was, as the following quotation will show, the opinion of Mr. Darwin:—  
 "We must remember that nearly all the other and more important differences between man and quadrumana are manifestly adaptive in their nature, and relate chiefly to the erect position of man; such as the structure of his hand, foot, and pelvis, the curvature of his spine, and the position of his head." Mr. Wallace, however, considers the feet and hands of man "as difficulties on the theory of natural selection." "How," he exclaims, "can we conceive that early man, as an animal, gained anything by purely erect locomotion? Again, the hand of man contains latent capacities and powers which are unused by savages, and must have been even less used by palæolithic man and his still ruder predecessors. It has all the appearance of an organ prepared for the use of

<sup>1</sup> "Descent of Man," p. 149.

civilised man, and one which was required to render civilisation possible."<sup>1</sup> But here again this acute observer diverges into his favourite by-path, and introduces a "higher intelligence" to bridge over his difficulties.

We have now reached a stage in this enquiry when a number of questions of a more or less speculative character fall to be considered. On the assumption that, at the start, the evolution of the hand of man was synchronous with the higher development of his reasoning faculties, it is but natural to ask where, when, and in what precise circumstances this remarkable coalition took place. I would not, however, be justified in taking up your time now in discussing these questions in detail; not because I think the materials for their solution are unattainable, but because, in the present state of our knowledge, they are too conjectural to be of scientific value. In the dim retrospective vista which veils these materials from our cognizance I can only see a few faint landmarks. All the osseous remains of man which have hitherto been collected and examined point to the fact that, during the larger portion of the quaternary period, if not, indeed, from its very commencement, he had already acquired his human characteristics. This generalisation at once throws us back to the tertiary period in our search for man's early appearance in Europe. Another fact—disclosed by an analysis of his present corporeal structure—is that, during a certain phase of his previous existence, he passed through a stage when his limbs, like those of the present anthropoid apes, were adapted for an arboreal life. We have therefore to look for the causes which brought about the separation of man from his quadrumanous congeners, and entailed on him such a transformation in his form and habits, in the physical conditions that would supervene on a change from a warm to a cold climate. In the gradual lowering of the temperature of the subtropical climate which prevailed in Central Europe and the corresponding parts of Asia during the Miocene and Pliocene periods, and which culminated in the great Ice age, together with the concurrent changes in the distribution of land, seas, and mountains, we have the most probable explanation of these causes. Whether man forsook his arboreal habits and took to the plains from overcrowding of his own species in search of different kinds of food, before this cold period subjected him to its intensely adverse circumstances, it would be idle for me to offer an opinion. Equally conjectural would it be to inquire into the exact circumstances which led him to depend exclusively on his posterior limbs for locomotion.

During this early and transitional period in man's career there was no room for ethics. Might was right, whether it emanated from the strength of the arm, the skill of the hand, or the cunning of the brain. Life and death combats would decide the fate of many competing races. The weak would succumb to the strong, and ultimately there would survive only such as could hold their

<sup>1</sup> "Natural Selection," p. 198.

own by flight, strength, agility, or skill, just as we find among the races of man at the present day.

In summing up these somewhat discursive observations, let me just emphasise the main points of the argument. With the attainment of the erect position, and the consequent specialisation of his limbs into hands and feet, man entered on a new phase of existence. With the advantage of manipulative organs and a progressive brain he became *Homo sapiens*, and gradually developed a capacity to understand and to utilise the forces of nature. As a handicraftsman he fashioned tools and weapons, with the skilful use of which he got the mastery over all other animals. With a knowledge of the uses of fire, the art of cooking his food, and the power of fabricating materials for clothing his body, he accommodated himself to the vicissitudes of climate, and so greatly extended his habitable area on the globe. As ages rolled on he accumulated more and more of the secrets of nature, and every such addition widened the basis for further discoveries. Thus commenced the grandest revolution the organic world has ever undergone—a revolution which culminated in the transformation of a brute into civilised man. During this long transitional period mankind encountered many difficulties, perhaps the most formidable being due to the internecine struggles of inimical members of their own species. In these circumstances the cosmic processes, formerly all-powerful so long as they acted only through the constitution of the individual, were of less potency than the acquired ingenuity and aptitude of man himself. Hence local combinations for the protection of common interests became necessary, and with the rise of social organisations the safety of the individual became merged in that of the community. The recognition of the principle of the division of labour laid the foundations of subsequent nationalities, arts, and sciences. Coincident with the rise of such institutions sprang up the germs of order, law, and ethics. The progress of humanity on these novel lines was slow, but in the main steadily upwards. No doubt the advanced centres of the various civilisations would oscillate, as they still do, from one region to another, according as some new discovery gave a preponderance of skill to one race over its opponents. Thus the civilised world of modern times came to be fashioned, the outcome of which has been the creation of a special code of social and moral laws for the protection and guidance of humanity. Obedience to its behests is virtue, and this, to use the recent words of a profound thinker, “involves a course of conduct which, in all respects, is opposed to that which leads to success in the cosmic struggle for existence. In place of ruthless self-assertion it demands self-restraint; in place of thrusting aside or treading down all competitors, it requires that the individual shall not merely respect but shall help his fellows; its influence is directed, not so much to the survival of the fittest, as to the fitting of as many as possible to survive. It repudiates the gladiatorial theory of existence. It demands that each man who enters into the enjoyment of the advantages of a polity shall be



mindful of his debt to those who have laboriously constructed it; and shall take heed that no act of his weakens the fabric in which he has been permitted to live. Laws and moral precepts are directed to the end of curbing the cosmic process and reminding the individual of his duty to the community, to the protection and influence of which he owes, if not existence itself, at least the life of something better than a brutal savage."<sup>1</sup>

These humble remarks will convey to your minds some idea of the scientific interest and profound human sympathies evoked by the far-reaching problems which fall to be considered in this Section. Contrasting the present state of anthropological science with its position some thirty or forty years ago, we can only marvel at the thoroughness of the change that has taken place in favour of its doctrines. Now man's immense antiquity is accepted by a vast majority of the most thoughtful men, and his place in nature, as a derivative animal at the head of the great chain of life, appeals for elucidation to all sciences and to all legitimate methods of research. But among the joyful pæans of this triumphal march we still hear some discordant notes—notes, however, which seem to me to die with their echoes, and to have as little effect on scientific progress as the whistling of an idle wind. For my own part I cannot believe that a science which seeks, in the spirit of truth, to trace the mysteries of human life and civilisation to their primary rootlets, a science which aims at purging our beliefs of superstitious figments generated in days when scientific methods were too feeble to expose the errors on which they were founded, a science which reminds us in a thousand ways that success in life depends on a correct knowledge of the cosmic forces around us, can be opposed to the highest and most durable interests of humanity.

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#### **"Lacustrine Antiquities."**

An important work on "Lacustrine Antiquities" will shortly be published by the Academic Society of Vaud and the Historical Society with the assistance of the Government of the Canton. MM. B. van Muyden, President of the Historical Society, A. Colomb, Keeper of the Museum of Lausanne; and Professors F. Forel, W. Cart, and A. de Molin have been appointed a Commission to edit an album of the collections of lacustrine antiquities which form one of the principal attractions of the Archæological Museum of Lausanne.

The work will consist of about forty large 4to plates, of which five or more will be coloured, and will be sold to subscribers at the price of 30 francs stitched, or 35 francs bound. The album will be accompanied by an explanatory memoir by M. A. Colomb, the present Curator of the Museum, and is promised some time in 1894.

<sup>1</sup> Huxley on "Evolution and Ethics," p. 33.



**Anthropology at the British Association (1893).**

By GEORGE W. BLOXAM, M.A., Recorder of the Anthropological Section.

THE proceedings of the Anthropological Section of the British Association at Nottingham this year were marked by the attendance of a more than usually large number of distinguished anthropologists, and although the principal papers were chiefly of an archæological character, physical anthropology and ethnography were by no means neglected.

The work of the Section commenced as usual with an Address delivered by the President, Dr. R. Munro, who spoke on the advantages which the erect position had conferred upon man.<sup>1</sup> There was a large audience, and the vote of thanks, moved by Sir John Evans, and seconded by Professor Hans Hildebrand, was enthusiastically accorded.

The following is a list of the papers read before the Section :—

Professor Hans Hildebrand.—“On Anglo-Saxon Remains and Coeval Relics from Scandinavia.”

J. Romilly Allen.—“On the Origin and Development of Early Christian Art in Great Britain and Ireland.”

Rev. E. Jones.—“Note on an Implement of Hafted Bone, with Tooth of Hippopotamus Inserted, from Calf Hole, near Grassington.”

Dr. J. H. Gladstone, F.R.S.—“On Ancient Metal Implements from Egypt and Lachish.”

R. Munro, M.D.—“Notes on Flint Saws and Sickles.”

J. L. Myres, M.A.—“Prehistoric Remains in Crete.”

R. Munro, M.D.—“The Structures of Lake Dwellings.”

Arthur Bulleid, F.S.A.—“A British Village of Marsh Dwellings.”

Professor W. Boyd Dawkins, F.R.S.—“On the Place of the Lake Dwellings at Glastonbury in British Archæology.”

Professor W. A. Herdman, F.R.S., and P. M. C. Kermode.—“On the Excavation of the Stone Circle of ‘Lag ny Boiragh,’ on the Meayll Hill, Isle of Man.”

Herbert Ward.—“Ethnographical Notes relating to the Congo Tribes.”

Miss M. J. Welch.—“The Primitive Americans.”

The Right Rev. Dr. Bompas, Bishop of Selkirk.—“The Indians of the Mackenzie and Yukon Rivers, Canada.”

Miss J. A. Fowler.—“The Australian Natives.”

Lionel Declé.—“The Ma-Goa.”

Lionel Declé.—“Funeral Rites and Ceremonies among the Tshinyai or Tshinyangwe.”

<sup>1</sup> See p. 174.

- Lionel Decle.—“The Arungo and Marombo Ceremonies among the Tshinyangwe.”  
 Mrs. Lilly Grove.—“The Ethnographic Aspect of Dancing.”  
 G. Hartwell Jones, M.A.—“The Prehistoric Evolution of Theories of Punishment, Revenge, and Atonement.”  
 Miss A. W. Buckland.—“Four as a Sacred Number.”  
 E. Sidney Hartland.—“Pin-wells and Rag-bushes.”  
 R. Etheridge, jun.—“On a Modification of the Australian Aboriginal Weapon termed the Leonile, Langeel, Bendi, or Buccan.”  
 R. Etheridge, jun.—“On an unusual form of Rush Basket from the Northern Territory of South Australia.”  
 H. Stopes.—“The Early Uses of Flint in Polishing.”  
 H. Stopes.—“Palæolithic Anchors, Anvils, Hammers, &c.”  
 Francis Galton, F.R.S.—“On the Recent Introduction in the Indian Army of the method of Finger Prints for the Identification of Recruits.”  
 J. G. Garson, M.D.—“On the External Characters of the Abyssinians examined by Mr. Bent.”  
 Crochley Clapham, M.D.—“The Mad Head.”  
 W. Wilberforce Smith, M.D.—“Some of the Conditions which modify Body Weight.”  
 Professor Windle, M.D.—“Anthropometric Work in Schools.”  
 J. Beddoe, M.D., and Dr. G. W. Leitner.—“On the Head Form of the Dards and of the Siah-Pôsh Kafirs.”

Several of these papers will be read before the Institute in the course of the ensuing session, and will be printed at length in the Journal.

Abstracts of a few of the more important of the others are appended:—

Professor Hildebrand's paper “*On Anglo-Saxon Remains and Coeval Relics from Scandinavia*,” was a valuable contribution to comparative archæology, and was illustrated by a beautiful series of engravings of ancient implements and ornaments of Swedish type earlier than, and coeval with, Anglo-Saxon Pagandom, together with examples of later developments.

The author explained how some of the ornaments differed in design from those of Roman and French origin, and said that the question proposed was to determine the relations which existed between the civilisation of Scandinavia and that of England during the period between the arrival of the Saxons on the English coast, and the time of their conversion to Christianity; that was roughly from the middle of the fifth to the middle of the seventh century of our era.

These limits were not exactly determinable, because both the Anglo-Saxon immigration and the spread of Christianity among the newcomers were not the work of a few years only; and pro-

gressed with very different rapidity in different parts of the country. During this period Sweden had no chronological record, and Christianity had no hold on the country until the eleventh century. The criterions of date therefore in the Scandinavian side were of a purely archæological kind. There were a few instances of Roman and Byzantine coins found associated with Scandinavian antiquities, and as these could hardly have found their way northward before the downfall of the Hunnic Empire in Central Europe, they gave some indication of the date of the objects with which they were lost or interred. In England, of course, similar date evidence occurred, but was vitiated by the fact that the coins had often evidently been long in circulation before they were buried.

The practice of burial also, while it entirely superseded cremation when Christianity became predominant, appeared to have coexisted with the older method during the later Pagan period, and could not be taken as affording an accurate criterion of age. And there was the further difficulty in comparing English and Scandinavian objects, that in England the Teutonic peoples found the British and Roman-British culture already existing on their arrival, while there was no parallel influence to modify the style of Scandinavian art.

Referring to the magnificent series of illustrations of Swedish antiquities which had been distributed among the audience, Prof. Hildebrand pointed out first the examples which by their style appeared to be of earlier date than the Saxon migration into England, and proceeded to discuss the Scandinavian types of sword and spear, which presented both remarkable likenesses and differences when compared with those which give their name to the Saxons ("sword-men"), and the Angles ("spear-men"). The boar-crest on the helmet also appeared to be a point of similarity.

Numerous examples were then adduced to show how designs borrowed from existing art were modified to suit Teutonic taste in the English series, which herein came nearer to the French and Belgian than to the Scandinavian. As illustrations of the development of style the ornamental fibulæ or brooches were of especial importance, and a number of types were cited to emphasise both the fundamental likeness and the differences in detail of the Teutonic taste in each side of the North Sea; and the gold "bracteate" ornaments, copied from Roman medals or coins, were examined in a similar way, showing how when the supply of models was cut short by the interposition of the Hunnic barrier between North and South Europe, the Teutonic craftsmen modified the Roman designs in the spirit of their native style. While the Scandinavian clay vessels present only partial likenesses with those from English sites, the glass vases which were occasionally found were almost identical in type, and seemed to have been exported from a single place of manufacture in the Rhine valley or the North of Gaul, and it was probable that the garnets which were

commonly used in the northern jewellery were similarly derived from a common source in the Carpathians.

Summing up his results, Professor Hildebrand concluded that a common Teutonic taste was the source of the art styles both of Scandinavia and of Saxon England; that the Scandinavian and Anglo-Saxon races were of closely-allied Teutonic descent, but that in the incessant movements characteristic of that stock the two branches were separated from one another, and developed independently; that the Kentish Jutes and the Saxons of England came not from Scandinavia, but from Germany; but that the case was not clear with regard to the Angles, who might possibly not be of German origin, but may have been settled at one time in the south-west corner of Scandinavia.

The object of the paper by Mr. J. Romilly Allen, "*On the Origin and Development of Early Christian Art in Great Britain and Ireland*," was to trace the various decorative elements found in early Christian art in Great Britain to their source, and to show in what way the native styles of art existing in this country at the time of the introduction of Christianity (*circa* A.D. 450) were influenced, first by the Italo-Byzantine art which came in with the importation of the illuminated MSS. used in the service of the Church, and subsequently by the coming in contact of the Anglo-Saxon and Scandinavian conquering races with the Celtic and other populations already inhabiting the British Isles. Early Christian art in this country is essentially decorative, and to a lesser extent symbolic. The conventional grouping and general treatment of the figure-subjects show that they are obviously barbarous copies of Byzantine originals. If any definite conclusions are to be arrived at with regard to the evolution of early Christian art in Great Britain, it must be by a careful examination and comparison of the minute details of the ornament. The ornament consists of the following elements:—

- |                             |  |
|-----------------------------|--|
| (1) Interlaced work         | } Geometrical.   |
| (2) Key patterns            |  |
| (3) Step patterns           |  |
| (4) Spirals                 |  |
| (5) Zoöomorphic designs     | } Suggested by animal,<br>human, and vege-<br>table forms. |
| (6) Anthropomorphic designs |  |
| (7) Phyllomorphic designs   |  |

The possible sources whence each of these different patterns was derived are next to be considered. These are divided into the native or imported styles of decorative art existing in Great Britain previous to the introduction of Christianity—namely, the art of the ages of stone, bronze, and iron, and Romano-British art; and the external sources, made accessible after A.D. 450—namely, the Italo-Byzantine, Anglo-Saxon, and Scandinavian styles. The spirals are to be traced to a "late Celtic" source in the late iron age, the interlaced work and phyllomorphic designs to an Italo-Byzantine source, the step patterns possibly to a Saxon source, the

zoöomorphic designs perhaps to a Scandinavian source, and the key patterns to the classical fret adapted to suit the diagonal setting-out lines usually employed in drawing early Christian ornament in Great Britain.

In the first part of his paper on "*Ancient Metal Implements from Egypt and Lachish*," Dr. Gladstone traced the gradual transition from the flint to the bronze age. He then described the composition of a number of implements found in Egypt, during the excavations conducted by Prof. Flinders Petrie, and at Lachish, an ancient Ammonite town in Syria. Some of these implements were of almost pure copper, but others were much harder and more like bronze.

The question was, from whence did the ancient Egyptians get their tin? Their knowledge of its existence was pretty well established by Prof. Petrie's discovery of a ring dating back to the 18th dynasty, or 1400 B.C., undoubtedly composed of this metal.

At Lachish there was a very high mound consisting of the ruins of successive towns. The date of the earliest (probably an Ammonite town) could not be determined, but after a series of similar towns they came to an Israelite town, and we know that the Ammonites were displaced by the Israelites, and that, in the time of Hezekiah, the Lachish of that day endured a long series of sieges by Sennacherib, and was probably destroyed by him. Right from the bottom to the top of this mound were found implements, those in the lower strata were of copper, or of copper mixed with a copper sub-oxide, while higher up in the mound were a number of bronze articles, especially arrow-heads. Not only was there a gradual change from copper to bronze, but the bronze itself gradually disappeared as the remains of the Israelite town were approached, and iron implements were found. Dr. Gladstone thought that the copper implements were hardened by allowing the oxide to be formed.

In his communication "*On the Structure of Lake Dwellings*," Dr. Munro described the various methods adopted by the lake-dwellers in the construction of the under-structures and platforms on which their huts had been placed:—

- (1) *Pfahlbauten*, or pile-structures proper.
- (2) Solid basements of wood, or islands made of mixed materials, crannogs, fascine structures, &c.
- (3) Cellular basements of beams arranged like a log-house.

After noticing the fragmentary indications of huts collected from time to time on the sites of lake-dwellings, the author went on to describe the ruins of a cottage exposed a few years ago by peat-cutters at the Schussenried, Würtemberg. It was of a rectangular shape, measuring 33 feet long by 23 feet broad, and its walls were constructed of wooden beams plastered over with clay. Its interior was divided into two compartments, one of which contained a hearth. Dr. Munro then gave a description of an



equally important discovery recently made in Argyllshire. This was a crannog showing foundations of a circular house 32 feet in diameter, and also divided into two compartments, one of which contained a hearth and the remains of a doorway.

Mr. Arthur Bulleid described "*A British Village of Lake Dwellings*" discovered by him in March, 1892. It is situated a little more than a mile north of the town of Glastonbury, in the upper part of one of the moorland levels of Central Somerset found to the south of the Mendip Hills. The site is fourteen miles from the coast of the Bristol Channel, but only about 15 feet above high-water level. As late as 1540 the neighbouring lands were occupied either by areas of water or swamp, one mere being five miles round. The village is bounded on its east side by a natural watercourse.

There is little on the surface to indicate the site of a village, but on careful inspection between sixty and seventy low circular mounds may be seen, varying from 15 to 35 feet in diameter, and from 6 inches to 2 feet 6 inches high at the centre. These form the foundations or floors of separate dwellings, which are constructed in the following way:—On the surface of the peat is a layer or platform of timber and brushwood kept in place by numerous small piles at the margin. On this a layer of clay is placed, slightly raised at the centre, where the remains of a hearth are generally found. The dwelling itself was composed of timber filled in with wattle and daub. Not only have the wall-posts been found *in situ*, but also the entrance threshold and doorstep.

The extent of the ground covered by the sixty or seventy mounds measures more than 400 feet north and south, by 300 feet east and west. The east border of the settlement has been met with, and is well defined by a thick line of piles and timber. This side of the village was undoubtedly, to begin with, protected by water, which in course of time was replaced by an accumulation of a peaty nature. It is in and on this formation outside the settlement that many interesting structures entering into the construction of the village have been unearthed, such as banks of clay and stone, morticed timber and hurdlework. Among other things that have been discovered is a boat 17 feet long, quantities of wheel and hand-made pottery, sling stones, and bones of animals, and a great number of objects of bronze and iron, horn, bone and stone, such as fibulæ and rings, knives, saws and weapons, combs, needles, pottery stamps, and querns.

Only one pot had as yet been dug up whole, but it had been found possible to reconstruct several others from the fragments that had been discovered. From one mound alone portions of as many as ten distinct pots had been recovered. The wheel-made pottery was frequently decorated with circles, curved and flowing lines, and also with straight lines and cross hatching, the designs being in many cases beautiful and elaborate. There were distinct signs that this pottery was made by the inhabitants of the settlement, for pieces of horn had been dug up with cup-shaped

depressions cut at the top, which had no doubt been used for making the circular marks seen on the pottery.

Up to the present time nothing in the shape of a coin had been found, nor had one single fragment of Samian or Roman pottery been met with.

Whatever might be the ultimate conclusion arrived at as to the probable date of the village, and who the occupants of these dwellings might have been, they had already gained some considerable amount of knowledge of the life they lived, the discoveries proving them to have been skilful workers in metals and carpentry, and also manufactures of pottery. They also knew that they were basket makers, and acquainted with the lathe. It was obvious also from the wheat and beans, the bones of sheep and cattle, that they had tilled and farmed the adjoining highlands, and that they used the horse and dog, and lastly they were makers of fabrics, the texture of which, in some cases, they could not do otherwise than assume was in harmony with the fine and delicate fibulæ used for fastening them.

In his paper on "*Pin-wells and Rag-bushes*," Mr. E. Sidney Hartland suggested that the object of throwing pins into the water, or tying rags upon trees, was to effect union with the divinity by the perpetual contact with the god of some article identified with the worshipper. Mr. Hartland did not question the accuracy of Professor Rhys' explanation that, in certain cases, the pins were looked upon as offerings and the rags as vehicles for the transfer of disease; but he contended that the original intention was different, and that these ideas only arose after the real motive was forgotten.

In a paper "*On Anthropometric Work in Large Schools*," by Professor Windle, the author gave the results obtained in answer to a circular sent to the head masters of one hundred of the largest schools in England, Scotland, and Ireland, inquiring whether any, and if so what, anthropometric investigations were carried on in their institutions, and the methods adopted in taking the various measurements. The replies show that some form of measurement is, or has been, carried on in twenty-five schools (Table I); but they also show that the methods adopted differ considerably (Table II), a fact which greatly detracts from the value of the observations for comparative purposes.

The advantages of systematic measurements of boys from the scholastic and the scientific points of view were alluded to, and it was suggested that an endeavour should be made to encourage and systematise such work in large schools.

TABLE I.—*Measurements taken (Number of Schools, 25).*

Height .. ..	25	Length of arm ..	3	Sight .. ..	5
Weight .. ..	21	Girth " " ..	10	Colour-blindness ..	1
Chest girth ..	23	Length of forearm..	3	Hearing .. ..	1
Size of head ..	0	Girth " " ..	10	Lift, or Archer's pull	2

TABLE II.—*Methods of taking Measurements.*

HEIGHT.		WEIGHT.		CHEST GIRTH.	
In boots .. ..	1	In ordinary clothes .	2	In ordinary clothes	0
In gymnastic shoes	3	In gymnastic „ ..	15	In gymnastic „ ..	7
In socks .. ..	15	Naked .. ..	0	Naked .. ..	12
In bare feet ..	1	Not mentioned ..	4	Not mentioned ..	4
Not mentioned ..	5				

A very brief reference must be made to the Reports presented by the various Committees that were appointed last year:—The Report of the Anthropometric Laboratory Committee gives the results of the observations made on fifty-five males and forty-nine females who were measured during the Edinburgh meeting; and a table at the end of the report gives the corrected means of the measurements of males taken during the last three meetings of the Association, at Leeds, Cardiff, and Edinburgh. The Canon of the proportions of the body is also given, and the report enables anyone who has been measured in the laboratory to find his place with respect to the corrected mean of each measurement.

The Committee appointed to promote an Ethnographical Survey of the United Kingdom presented their First Report.

The Report is purely preliminary, but gives evidence of a vast amount of work having already been done. The Committee propose to record for certain typical villages, parishes, or places, and their vicinity:—

- (1) Physical types of the inhabitants.
- (2) Current traditions and beliefs.
- (3) Peculiarities of dialect.
- (4) Monuments and other remains of ancient culture.
- (5) Historical evidence as to continuity of race.

At the end of the Report, Forms of Schedule are given which are supplied to correspondents and upon which they are requested to record their observations.

The Committee appointed to consider the question of Uniformity in the Spelling of Barbaric and Savage Languages and Race names, recommend that the system of orthography already adopted by the Royal Geographical Society, the Admiralty, the Foreign Office, the Colonial Office, the War Office, and the Government of the United States of America should be generally used in the titles of papers.

Reports were also presented by the Committee appointed to investigate the Physical Characters, Languages, and Industrial and Social Condition of the North-Western Tribes of the Dominion of Canada; the Committee for the Exploration of Ancient Remains at Aksum in Abyssinia; and the Committee on the Physical Deviations from the Normal among Children in Elementary and other Schools.

New Committees were appointed for “Anthropometric Work in Schools” and for carrying on the operations at Glastonbury.

### **The International Congress of Anthropology.**

THE International Congress of Anthropology convened at Chicago, Monday, August 28th, held daily morning and evening sessions during the entire week, closing Saturday, September 2nd [*Science*]. All the meetings were well attended, and there was more than a full supply of excellent papers on various branches of anthropologic science, which frequently elicited animated discussion.

The session on Monday was opened by the address of the President of the Congress, Dr. Daniel G. Brinton, whose subject was "The Nation as an Element in Anthropology." It was intended to show the physical, mental, and social changes which take place when man passes from a consanguine or tribal condition of government to that which is national. This transition exerts a profound influence on the physical man through new laws of marriage and relationship, and on religion, ethics, jurisprudence and art through the extension of the intellectual horizon. The goal of such changes, the speaker predicted, will not be reached in nationalism, but in internationalism, and in the supremacy of the individual, as the only proper aim of government. The remainder of the day was taken up with the exhibition of trepanned skulls from ancient Peru, by Senor M. A. Muniz, and explanations of the anthropological laboratories of the Department of Ethnology at the Columbian Exposition, by Drs. Franz Boas, Joseph Jastrow, H. H. Donaldson and G. M. West. The latter offered a paper of great merit on the anthropometry of North American school children, and Dr. Boas one on the physical anthropology of North America, the result of very extended measurements.

Tuesday was devoted to Archaeology, principally American. Mr. H. C. Mercer, however, exhibited an artificially flaked stone from the San Isidro gravels, near Madrid, Spain, exhumed by himself, and explained its probable palæolithic character. Professor G. H. Perkins read a *résumé* of archæological investigations in the Champlain Valley, and Professor Otis T. Mason described in a most interesting manner the mechanical resources invented and developed by the aboriginal toilers of the American continent. The anthropological work at the University of Michigan was sketched by Mr. Harlan J. Smith; Senor Emilio Montes entered a plea for the great antiquity of the civilisation of Peru; and Dr. Carl Lumholtz, just back from his explorations among the cave-dwellers in the Sierra Madre of Chihuahua, described their condition and exhibited specimens of their industries. The paper which attracted most attention, however, was that of Mrs. Zelia Nuttall on the Mexican calendar system, in which she presented a highly ingenious theory for the solution of this obscure and famous problem, supporting it with lengthy computations and the opinion of competent astronomers. The afternoon was spent in discussing the collection of games in the anthropological building by Dr. Stewart Culin, Captain J. G. Bourke and Mr. Frank Cushing.

The session on Wednesday was devoted to ethnology. It was

opened by a paper by the President, Dr. Daniel G. Brinton, on the alleged evidences of ancient contact between America and other continents, in which he categorically denied that any language, art, religion, myth, institution, symbol, or physical peculiarity of the American aborigines could be traced to a foreign source. Miss Alice C. Fletcher and Prof. J. C. Fillmore presented a joint study of native songs and music of great interest. Mr. Walter Hough exhibited and described bark cloth from various primitive tribes; Mr. G. A. Dorsey related a peculiar observance among the Quichua Indians of Peru; Mrs. French-Sheldon spoke of some curious customs noticed by her among the natives of East Africa; and the Rev. S. D. Peet presented a memoir on secret societies among the wild tribes. The afternoon was spent in discussing the anthropological collections in the U.S. Government Building, Professor O. T. Mason referring to an industrial exhibit based on linguistic stocks; Mr. W. H. Holmes offering a critical study of the development of flaked-stone implements; Mr. Frank Cushing giving the particulars of a curious Zuni dramatic ceremonial; and Dr. Cyrus Alder reviewing museum collections made to illustrate religious history and ceremonies.

Thursday morning was assigned to folk-lore, and papers were presented by Mr. W. W. Newell on ritual regarded as a dramatisation of myth; by Dr. Franz Boas on the ritual of the Kwakiutl Indians; by Mr. J. Walter Fewkes on Tusayan ceremonial dramatisation; and by Mr. George Kunz on the folk-lore of precious stones. The afternoon was devoted to the collections of American archæology in the anthropological building under the care of Professor F. W. Putnam, Chief of the Department, who delivered the opening address on the subject. He was followed by Mr. Frank Cushing on the "cliff-dwellers"; by Mrs. Zelia Nuttall on Mexican archæology; by Mr. G. A. Dorsey on South American archæology; and by Mr. E. Volk on cache-finds from ancient village sites in New Jersey.

"Religions" was the subject taken up on Friday morning. Dr. Morris Jastrow, Jr., began with an explanation of the method and scope of their historical study; Mrs. Sarah Y. Stevenson gave an interesting sketch of an ancient Egyptian rite illustrating a phase of primitive thought; Mrs. Matilda C. Stevenson contributed a chapter in Zuni mythology obtained by personal study on the spot; and Mr. F. Parry read a theory relating to certain elements of religious symbolism. The afternoon was given to discussion of various points in North American ethnology by Professor O. T. Mason and to the ethnology of Paraguay by Dr. Emil Hassler.

The last day, Saturday, was set apart for "Linguistics," and for reading papers which had been crowded out on previous days. Dr. Daniel G. Brinton gave a brief review of the present status of our knowledge of American languages with special reference to the parts of the continent in which it is deficient. These he especially found in Mexico and central South America. Dr. Boas stated his classification of the languages of the North Pacific coast; Dr.



C. Abel illustrated his theory of the affinities of the Egyptian and European languages; Mr. Richardson read a paper on the Cameroons of South Africa; Mr. Wildman on the ethnology of the Malay peninsula; and Dr. Jahn on the ethnological collection in the German village at the Fair. The session and the week closed with a social dinner in the Midway Plaisance given by the American to the foreign delegates, presided over by Professor F. W. Putnam and Dr. D. G. Brinton, which closed the scientific proceedings in the most agreeable manner.

All of the papers mentioned above were read before the Congress and discussed as far as time permitted. Besides these, a number were read by title from writers who could not be present. Among them were Mr. Horatio Hale, A. L. Lewis, Dr. A. F. Chamberlain, Dr. F. S. Krauss, M. Raoul de la Grasserie, Dr. F. Jacobsen, Senor C. De la Torre, and others.

The number of foreign delegates embraced a fair proportion of those present, and in this respect the Congress merited its title as an "international" one. Among them may be mentioned Dr. Carl Peters, the Imperial German Commissioner for East Africa, Senor Manuel M. de Peralta, Minister from Costa Rica, Dr. Carl Abel, the well-known Egyptologist, Mr. C. Staniland Wake, of London, Dr. A. Ernst, of Venezuela, &c.

It was decided to print at an early date the transactions of the Congress by subscription. They will form a volume of 500 pages, price \$5.00, subscriptions for which may be sent to Dr. Franz Boas, Secretary, Department of Ethnology, Columbian Exposition, Chicago.

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**Native Inhabitants of the Philippine Islands.**—The permanency of tropical temperature in the islands, however favourable for the production of sugar, hemp, tobacco, and vegetation generally, tells much even on the physique of the native inhabitants, who are mostly undersized and not too well favoured specimens of the Malay type. They are, however, when young, very docile, and make as "muchachos," or boys, very fair household servants. The natives are all called "Indios" by the Spaniards, and are, as a rule, unenterprising and indolent, unless well looked after. They never talk to their employers, and seem to be incapable of any attachment to them. They are much in the hands of the priests, and are very superstitious. Their chief sports are cock-fighting and gambling, and most of the Malay men and boys have a pet "coq de bataille," who they carry about like a baby on their arms, and whose comfort they look to before that of wife or children. Women, children, and priests smoke everywhere, and especially in the streets; a grey-haired old lady with a huge cheroot in her mouth is no uncommon object out of doors. The people are, however, clean in their habits externally. The men usually wear spotless shirts, sometimes with

embroidered fronts, and with skirts floating outside their trousers, which have at first a peculiar appearance, and the women wear clean gauzy scarves of piña over their shoulders, sometimes richly embroidered, with a bodice of the same stuff, and a long skirt of some bright stuff, with a shorter over-skirt of some black silken material. They generally go barefooted altogether. A few, however, wear socks, with "chinelas," or slippers, in fine weather, and clogs in wet weather. They carry generally black umbrellas, which serve as parasols and umbrellas at the same time, and are very fond of tawdry jewellery. The richer "mestizas" are ablaze with "strass" on holidays and feast days.

Such are the people in the towns, but there are tribes in the interior still, as I have mentioned, in a savage or half-savage state—the Igorrotes of the mountains in the west of Luzon are one tribe of these, the Negritos of the island, of evident negro origin, are another, and the Moros of Mindanao, already mentioned, who appear to be descended from the Mussulman Dyaks of Borneo. [Foreign Office Reports, Annual Series, No. 1289.]

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**Opium in Persia.**—One hundred and three thousand, nine hundred and fifty tumans (£26,654) worth of opium was reported as dispatched, during the past year, to Kirman and Yezd and the Persian Gulf for India and China and other countries. These figures are probably far too high. A few years ago only a comparatively small quantity of opium was grown sufficient for home consumption. Now it is cultivated for exportation. At the present moment wherever there is a cultivation in Khorasan, a large portion of it is white with the poppy. The retail price now in Meshed is 9 tumans per man, or about 7s. per lb. There is, in fact, a great inducement to the people to cultivate opium extensively. A large portion of the population use it as a drug. They are divided into two classes; the smokers and the eaters. The former may be classed with habitual drunkards who are past redemption. There is no cure, and the opium smoker can be recognised at once by his sallow countenance, sunken cheeks, nervous gait, and, as a rule, filthy appearance. After a time he becomes unfit for employment, and is spoken of with contempt even by the opium eaters. These latter, as a rule, are middle aged and old people, and simply take one, two, or three opium pills morning and evening. When they go beyond that they soon exchange the pills for the pipe. A pill weighs one-sixthundredth of an ounce. Among the gentry of Meshed it may be said that one-fifth smoke opium, and of their servants one-fourth. Among the merchants and shopkeepers one-tenth smoke. Perhaps one-tenth of the remainder take opium pills, excluding the labouring classes, who neither smoke nor eat it. The native hakims (or doctors) recommend opium as a sovereign remedy for nearly all ailments. They follow the principles of Abu Ali Sina (Avicenna), and divide all diseases

into two classes, hot and cold, and administer a hot medicine to cure a cold complaint and *vice versâ*. It is found necessary now to give a little opium to the newly born children of confirmed opium smokers. The poppy requires very little water; once when the seed is sown, and once when the plant flowers. It also does not damage the soil and can be sown on the same ground for successive years.

It is a significant fact that two or three years ago opium had become so cheap that it hardly repaid the cultivator, and that in consequence the area cultivated began to diminish. But now merchants have begun to buy up the drug for export and to send it south: the recultivation has begun with renewed energy. [Foreign Office Reports, Annual Series, No. 1268.]

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**"A Survey of the Antiquarian Remains on the Island of Inismurray."** By W. F. Wakeman. (Williams and Norgate, 1893.) pp. i-xxi, 1-159, 84 figs. and 8 plates. This is a very careful and well illustrated archaeological survey of one of the most interesting islands in the British Archipelago, made by a distinguished Irish antiquary. Inismurray, which lies four miles off the coast of Sligo, is a veritable museum of antiquities, containing a fine cashel, or stone fort, probably of pre-Christian date; the Church of the Men; the Church of the Women; the Church of the Fire which contained, until it was destroyed, as it is said, by the Board of Works, a slab on which formerly a sacred fire perpetually burned; numerous carved crosses; altars on which are swearing stones; a couple of holed stones at which pregnant women pray; holy wells and other interesting remains, amongst which may be mentioned a sweat-house, or hot air bath. The latter is widely distributed in Ireland, and appear to be still employed in cos. Cavan and Leitrim. All the remains are described and figured, and drawings of crosses and other sculptures are given. There are numerous references to customs and beliefs, some of which must date back to pagan times. "In general the people are of a fair-headed, comely, well-built race, and they are expert, courageous boatmen." The population numbers about 100, the most common names being Brady, O'Heraghty, O'Boyle; the O'Currets have recently died out. Irish is, of course, spoken amongst themselves. The monastery was founded by St. Molaise, or Laisrén, probably about A.D. 520 or 540. In "A.D. 802 Inismuiredaich (as the island was then called) was burned by the foreigners" (Scandinavians). Mr. Wakeman passes very severe criticism on the "restorations" of the Irish Board of Works which is not at all too strong if his statements are correct, and judging from the action of the same Board in the Aran Islands, co. Galway, at Skellig Michael, co. Kerry, and elsewhere, there is only too good reason to believe that, from an archaeological point of view,

these monuments have irreparably suffered from the "conservers" to whose care they have been entrusted. The proper maintenance of the ancient monuments of the British Islands is of such importance that the action of the Board of Works cannot be too closely watched. Attention has occasionally been drawn by archæologists to some of the performances of the Board of Works for Ireland, but with no effect, and it has now become necessary to draw the attention of others to this matter.

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**"Fians, Fairies and Picts."** By David MacRitchie. (Kegan Paul, 1893.) 8vo. pp. xxii. 77. 22 plates. The volume, an amplification of a paper read before the Folk-lore Society, discusses the origin of the tales of "fairies," and concludes that they are based on the fact that colonies of people cognate to the Lapps from time to time formed settlements, and, with their animals, were considered as supernatural by the tall natives.

**"Indian Wisdom,"** or examples of the religious, philosophical, and ethical doctrines of the Hindus. With a brief history of the chief departments of Sanskrit literature, and some account of the past and present condition of India, moral and intellectual. By Sir Monier Williams. 4th edition, pp. 575. 1893. (Luzac.) The volume is "designed as much to give a summary of the history of Sanskrit literature as to present the reader with examples of certain selected portions of that literature."

**"Blackfoot Lodge Tales;"** the story of a Prairie people. By G. B. Grinnell. (Nutt, 1893.) pp. xv. and 310. "I give the Blackfoot stories as they have been told to me by the Indians themselves, not elaborating nor adding to them. In all cases except one, they were written down as they fell from the lips of the story-teller." The volume gives a most vivid idea of Indian life.

**"Pawnee Hero Stories and Folk-Tales,"** with notes on the origin, customs, and character of the Pawnee people. By G. B. Grinnell. (Nutt, 1893.) pp. 446. The stories, like those in the previous work, were taken down on the spot from the people themselves. An appendix on the language is given.

**"The Ruined Cities of Mashonaland,"** being a record of excavation and exploration in 1891. By J. T. Bent. (Longmans, 1893.) pp. 427. 8vo. The archæology, geography and ethnology of the ruins are very fully discussed, and the whole is amply illustrated.

**"The Ghost World."** By T. F. Thiselton Dyer. (Ward and Downey, 1893.) pp. 447. 8vo. The volume contains a large amount of phantom lore from all parts of the world.

**"Irish Legends and Stories."** By S. Lover. (R. E. King.) pp. 386.

**"An Ohio Cave Dwelling."** By A. P. L. Pease. pp. 6 (plate).

**"A Study of the Languages of Torres Straits."** Part 1. By S. H. Ray and A. C. Haddon. pp. 153. Reprinted from "Proc. R. Irish Acad." 3rd Ser., vol. ii, No. 4.

**"The Secret Commonwealth of Elves, Fauns, and Fairies,"** a study in Folk-lore and Psychical Research. The text by Robert Kirk, M.A., Minister of Aberfoyle, A.D. 1691. The Comment by Andrew Lang, M.A., A.D. 1893. (D. Nutt, 1893.) pp. lxx and 92. "Mr. Kirk of Aberfoyle, living among Celtic people, treats the world of faery as a mere fact in nature, a world with its own laws, which he investigates without fear of the Accuser of the Brethren. We may thus regard him even more than Wodrow, as an early student in folk-lore and in psychical research—topics which run into each other—and he shows nothing of the usual persecuting disposition."

**"Origins of the Pictish Symbolism; with notes on the Sun boar, and a new reading of the Newton inscriptions."** By the Earl of Southesk. (D. Douglas, 1893.) pp. 95. 4to. 11 plates. The conclusions arrived at are—"that in all probability the pillar-stone symbolism was brought into Pictavia during, or shortly before, the reign of King Nechtan, 458-482 A.D. That it was brought by a wandering band of Norsemen . . . who through superior culture and knowledge of secret mythologies, gained an influential position, perhaps as Magi . . . That . . . the symbolism . . . was used as a means of designating rank . . . That after the general adoption of Christianity, towards the end of the sixth century the symbols were continued in their secular uses . . . and that about the same period an architectural transition to cemented walls and dressed stones began . . ."

**"Irish Stone Axes and Chisels."** By W. J. Knowles. Reprinted from "Journal R. Soc. Antiq. Ireland." Part 2, vol. iii. 5th Series, July, 1893.

**"Yoruba History, table of principal events in."** By J. A. O. Payne. (Lagos.) The volume contains a valuable amount of information on local history, &c.

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**"Journal of the Buddhist Text Society of India."** Vol. i. No. 1. "The object of this Society is to make independent research in the domain of history, philosophy, literature, and in short everything that relates to the sociological and religious institutions of India in the Buddhist period." Indian Pandits in Thibet, S'a'nti Rakshita, life of Atíśa, the Lamaic Hierarchy of



Thibet, the first Játaka. Bodhi Patha Pradīpa, translated by Sarat C. Das. A brief sketch of the Bon religion of Thibet. Folk tales.

**"Journal of the Royal Statistical Society."** Vol. lvi. Part I. Distribution and movement of the population in India, by J. A. Baines. Results of an enquiry as to the physical and mental condition of fifty thousand children seen in one hundred and six schools, by F. Warner, M.D., F.R.C.P.

**"Belfast Naturalists' Field Club, Annual Report and Proceedings."** 1892-93. Ser. ii. Vol. iii. Pt. 6. This energetic and thriving club interests itself with Archæology as well as with Natural History, and archæologists would do well to glance over back volumes of its Proceedings. The present number contains a fully illustrated article on "Worked Flints, Ancient and Modern," by Mr. W. Gray, who has a very extensive knowledge of Irish flint implements. There is also an account of the formation of a Committee in January last for the purpose of studying the Ethnography of Ulster in connection with the Irish Branch of the British Ethnographical Survey. Professor Haddon gave a popular lecture on the "Aran Islands; a Study in Irish Ethnography," and the following day addressed an enthusiastic meeting at which the Committee was organised, and Mr. W. H. Patterson of Garra-nard, Strandtown, Belfast, was elected as its secretary. The first results of this new departure are the following papers in the Proceedings:—"Some Local Folk-lore," by F. J. Bigger, Secretary to the Club (Rea's Buildings, Belfast); "Pishogues from Tipperary," by Miss L. S. Mollan; "Irish Fairies," by W. H. Patterson; "Items of Folk-lore, principally from County Down," by Mrs. Blair.

**"The American Anthropologist."** Vol. vi. No. 2. Time keeping by light and fire, by Walter Hough. Bibliography. Vol. vi, No. 3. The last town election in Pompeii, an archæological study of Roman municipal politics based on Pompeian wall inscriptions, by J. C. Welling. Are the Maya Hieroglyphs phonetic? by Cyrus Thomas (plates). Some mythic stories of the Yuchi Indians, by A. S. Gatschet. Recent archæologic find in Arizona, by J. Mooney. Central American ceremony which suggests the snake dance of the Tusayan villagers, by J. W. Fewkes (plates). On the evolution of the art of working in stone, by J. D. McGuire (2 Figs.). Further notes on Indian child-language, by A. F. Chamberlain. Prehistoric irrigation in Arizona, by F. W. Hodge. Bibliography.

**"The American Antiquarian."** Vol. xv, No. 4. Sculptured image, Pantaleon, Gautemala. The age of the Mound Builders, by T. L. Gaertner. Blackfoot Star Myths, by R. N. Wilson. Legend of Cumberland Mountain, by J. A. Watkins. Mounds and Relics

in Manitoba, by C. N. Bell. Man and Language, by H. Hale. Pictographs and rock paintings of the South West, by L. W. Gunckel. Ethnographic religions and ancestor worship, by S. D. Peet (illustrated).

**"The American Journal of Psychology."** Vol. vi, No. 1. Syllabus of lectures on the psychology of pain and pleasure, by B. I. Gilman. The new life, a study of regeneration, by A. H. Daniels. The language of childhood, by F. Tracy.

**"Timehri"** (B. Guiana). Vol. vii, part 1. The Indians of Guiana, by J. J. Hartsinck, 1770 A.D. Negro folk-lore scraps.

**"Société de Borda,"** 1893. Part 1. Grammar of the dialects of the Landes. The cave of Brassempouy (illustrated). 1892. Part 4. The ancient use of salt.

**"L'Anthropologie."** Vol. iv, No. 2. The Hak-kas (an essay on the inhabitants of the province of Canton, translated from the English of Dr. Eitel in "Notes and Queries" of Shanghai). The natives of the Solomon Islands, by Dr. A. Hagen. No. 3. The matriarchal family system of the Caucasus, by M. Kovalevsky. A contribution to the anthropology of certain races of Oceania, by Dr. H. Ten Kate. Anthropology in the United States, by Dr. P. Topinard.

**"Bulletins de la Société d'Anthropologie de Paris."** Vol. iii, No. 3. The Iberian race, by M. Lajard. Burial in a Dolmen at Mareuil-lès-Meaux (Seine and Marne), by M. Emile Petitot. The Canstadt skull, by Georges Hervé. The evolution of Buddhism, by Julien Vinson.

**"Revue Mensuelle de l'École d'Anthropologie de Paris."** APRIL, 1893: The bronze age, by G. de Mortillet, 7 illustrations. MAY: On skulls from Morvan, by L. Manouvrier, 5 illustrations. JUNE: The race of "Troglodytes Magdaleniens." JULY, 1893. The dolmens of Charras (6 Figures). AUGUST. On Torques, by A. de Mortillet (10 Figures).

**"Annales de la Société d'Archéologie de Bruxelles."** Vol. vii, No. 3. Discovery of four prehistoric stations near Bruges (plates).

**"Bulletin de la Société d'Anthropologie de Lyon."** Vol. xi. No. 1. On papillary lines and imprints by Dr. Forgeot. Anthropological researches on Transcaucasian Tartars, by E. Chantre. Origin and antiquity of the first age of iron in the Caucasus, by E. Chantre.

**"Rapport"** sur le Congrès International d'Anthropologie de Moscou. By Baron de Baye. 1893.